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POPULATION, EDUCATION AND SOCIETAL RESTRUCTURING IN MALAYSIA

LEE KIONG HOCK
Faculty of Economics and Administration
University of Malaya
Pantai Valley
Kuala Lumpur
Malaysia

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The broad view of 'population studies' which I have adopted here, and the empirical findings contained in this report, will, I hope, spur others to similar areas of research, especially those in Malaysia in order that we may achieve that great Malaysian dream - national unity.

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Table 1

Labour Force and Unemployment by Age-Groups
1967/68 to 1976 ('000)

Age Group	1967/68			1974			1975			1976		
	LF	UnN	RF	LF	UnN	RF	LF	UnN	RF	LF	UnN	RF
15-24	826.5	132.9	75.2	1184.8	182.3	68.0	1346.0	178.8	69.9	1344.7	163.5	65.8
25-34	678.1	23.2	13.1	941.9	31.8	11.9	978.4	35.1	13.7	1031.4	36.2	14.6
35-44	515.9	10.3	5.8	723.1	18.0	7.0	733.5	14.9	5.8	748.8	17.5	7.0
45-64	578.1	10.3	5.8	781.0	35.1	13.1	765.2	27.1	10.6	777.0	31.3	12.6

LF: Labour Force

UnN: Unemployment

RF: Relative Frequency of Unemployment

Source: Department of Statistics (1970, Table 10.0.0, p. 19, and Statement 9, p. 118; 1977, Tables A.2 and A.4, pp. 4 and 6; 1978, Tables A.2 and A.4, pp. 4 and 6; 1980, Tables A.9 and A.11, pp. 11 and 13).

up any diminishing effects from lower population growth. In fact, rising expectations in many areas can be realised only if population growth is slowed (Corsa and Oakley 1979, p. 55).

On the whole, one may conclude that rapid population growth generally leads to a quality of life that is lower than can be expected from slower population growth. Most of the effects in the relationship between population growth and the quality of life are the result of a limited ability to expand productivity and total output due to the need for duplicating basic needs, so that the quality of life either declines absolutely or is relatively lower than otherwise.

Perhaps the most visible consequence of the change in the age-structure which surfaced clearly in the immediate post-war period is the heavy pressures it places on the educational system and subsequently in the labour market. The available statistical evidence shows some improvement in the unemployment problem experienced by youths but it is nevertheless evident that the growth of productive capacity has not been fast enough to absorb the young people into the labour market. Youth unemployment, which is now a major social issue in the developed countries (see Psacharopoulos 1980), remains problematic since independence.[7]

Table 1 gives a summary picture of the problem of youth unemployment in Malaysia. Though the number of young unemployed has increased (23.0 percent between 1967 and 1976) far less than that of the older cohorts (94.1 percent for those aged 25 to 64), the percentage of youth unemployment relative to overall unemployment remains high compared to those in the developed countries (see Psacharopoulos 1980). The frequency has always been at least around the two-third mark - a statistic which policy-makers can hardly ignore. The problem here is compounded by the existence of a relationship between education and unemployment.

Disaggregation of unemployment by educational level gives the clue that unemployment may in some way be related to education. Within the context of the changing age-structure, data on youth unemployment by educational level should form the basis for analysis. Unfortunately, in the case of Malaysia, such data are not readily available. However, to the extent that youth unemployment accounts for two-thirds of all unemployment, the available data showing total unemployment by educational

economic sense since they include depreciation which bears neither a technical nor a behavioural relation to net capacity change (Crosson 1966, p. 57).

It must be acknowledged that the above type of projection model has a number of statistical weaknesses when used in LDC's but it does show that with a high population growth a modest increase in per capita income will require investment ratios well beyond the capacity of most LDC's (Lim 1973, p. 72).

Coale and Hoover (1958) have argued that population growth per se does not increase the supply of investable resources. Where the supply of capital is inelastic a higher rate of population growth implies that significant portions of the available capital are detoured from productive investment to meet immediate social needs. For instance, rapid population growth compounded with the typical LDC age pyramid means that the number and proportion of young people to be educated increases just as capital is needed for projects with short-term economic returns. If large portions of government expenditures have to go to education or other forms of investment with only long-term returns, then capital for direct, quick return development is necessarily limited and reinvestment is restricted. This assumption of an inelastic supply of capital is more realistic than one which claims massive unused resources in LDC's (Ness 1963). It is also important to distinguish between potential resources and actual resources. For the former to materialise more capital and entrepreneurship may be required than is available at the moment (Lim 1973, p. 72).

Contrary points of view (e.g. Clark 1968) about the relationship between population growth and GNP should be mentioned. One argument is that increasing population could allow greater specialization - a step towards higher per capita productivity. However, Corsa and Oakley (1979) have argued that nutrition and training have more influence on the capacity of an economy to specialize than the growing numbers in the labour force. A second argument is that rapid population growth could be 'the principal motive force' of agricultural revolutions (Boserup 1965, Clark 1968). The argument is that population pressures will call forth people's best efforts. However, it must be realised that it is not only population that exerts pressure for change. Because of the multiplier effect, rising expectations will easily take

instance, the mean number of children desired has declined from 5.1 in 1966/67 to 4.4 in 1974. There has also been a significant increase in the percentage of currently married women with knowledge of family planning; the proportion increased from 44 percent in 1966/67 to 92 percent in 1974. Another clear indication of the knowledge and practice of family planning is the increase in the proportion of currently married women who have ever used contraception from 14.3 percent (currently using 8.8 percent) in 1966/67 to 53.2 percent (35.5 percent) in 1974 (see Chander, et.al. 1977). It is apparent that family planning and 'population control' have come a fair distance since the establishment of the National Family Planning Board (NFPB) in 1966. However, the impact of a decline in fertility now will not be felt on the size of the labour force for almost a generation. In the meantime the pressures from the three pertinent demographic factors sustained over a relatively long period on the economy as a whole and on Malaysia's ultimate, yet most abstract, goal of national unity will have to be grappled with.

II The Socio-Economic Consequences

The pressures that the three demographic factors exert on the economy can be seen very clearly in the attempts by the government to raise the quality of life of the people.[5] At the overall level, and taking GNP as a basic indicator of the quality of life, the preponderance of thought is that rapid population growth has a negative effect on per capita GNP. Growth in GNP requires both capital as well as labour, but with rapid population growth it is unlikely that infusions of capital will keep pace. For instance, with a population growth rate of 2.5 percent - as has been indicated for Malaysia - the level of capital formation required to maintain the same per capita GNP will, on the assumption of an incremental capital-output ratio (ICOR) between 3 and 4, be between 7.5 to 10.0 percent of the GNP.[6] If the government decides to increase per capita income by a target rate of 5.4 percent per annum (see Malaysia 1979, p. 22) then GNP will have to increase by just over 8 percent, and the investment ratio, with the same range of values for the ICOR, would be between 24.1 to 32.1 percent. As it stands, Malaysia's gross fixed capital formation (26 percent of GNP) only just makes it to this range, but then gross figures do not make

structure (see Chander, et.al. 1977, pp. 9-14) in the period prior to independence. As the rate of natural increase became a more important determinant of population growth than migration the age-structure changed. The typical age pyramid of a high rate of natural increase has become apparent since censal year 1957. Compared to 1931, say, the age-structure in 1975 is young with 41 percent of the population under 15 years - more in line with the typical age pyramid for LDC's. The projected trend from 1970-90 shows that unless fertility declines by about 30 percent during the period the age-structure in 1990 will be quite similar to that of 1970 (see Department of Statistics 1974). Though this appears likely the population will remain relatively young compared with those of the DC's by 1990.[4]

Third, and perhaps the most obvious of colonial legacies, is the ethnic composition of the country. Prior to the advent of the British the country was populated mainly by Malays who had emigrated from mainland Asia. However, with the coming of the British the more or less singular society was transformed into a plural society (see Smith 1952, Caldwell 1961). Current estimates show a multi-racial society consisting of a simple majority of Malays (53.3 percent) and two large minorities - the Chinese (35.4 percent) and Indians (10.5 percent). Two pertinent points in conjunction with the demographic composition of the population should be noted. The ethnic distribution of the population between urban and rural areas shows great variations in the degrees of urbanization between the various racial groups. The Chinese show the greatest degree of urbanization with 50.8 percent of the population residing in urban areas in 1975. The corresponding percentages for the Malays and Indians are 18.0 and 37.8, respectively. The second pertinent point here lies on the political level. With their exit the British entrusted the Malays with the political power in the country. This they still maintain by virtue of the demographic distribution of the ethnic groups, as stated above, and an electoral weighting system in the allocation of votes which favours the predominantly rural, Malay areas.

As stated above, the statistical evidence shows that a secular decline in fertility has set in. In fact the latest available report shows promising trends in terms of general attitudes towards family planning and the knowledge and use of contraceptive devices. For

CHAPTER I

POPULATION GROWTH AND THE ROLE OF EDUCATION IN MALAYSIA

I Three Pertinent Demographic Factors

Time-series demographic data show very vividly the major problems confronting Malaysia[1] which have become major facts of the country's political and economic life. The three major factors which are of considerable importance in this context may be directly or indirectly attributed to the country's colonial heritage.

In the intercensal years, 1911-21, 1921-31, 1931-47, 1947-57 and 1957-70, the annual growth rates in population were about 2.4 percent, 3.0 percent, 1.8 percent, 2.8 percent, and 2.9 percent, respectively.[2] These rates, apart from the dip in the war years, are comparatively high by international standards. Based on current population estimates it is indicated that the population will continue to register a high annual growth rate of 2.5 percent, implying that the population will double in 27.7 years.[3] Even with effective family planning the population will exceed the 20 million mark by the year 2000; about 47 percent more than the 13.6 million estimated in 1980 for all Malaysia. A more pertinent point here relates to the underlying cause of the high annual rates of growth. The increase in population during the pre-war period was accounted for largely by the heavy net immigration which reached a peak in 1937. As a prelude to the economic development of the country as a supplier of primary commodities for the United Kingdom, the British actively encouraged the immigration of large numbers of Chinese and Indians into Malaysia (see Ooi 1963). With the passage of time, mass immigration ceased and the natural increase in population became a significantly more important factor. Since independence in 1957 the annual rate of growth has come very close to that of the natural increase indicating that net migration is now a negligible factor in population growth. The momentum for rapid population growth now lies within the population itself.

The second major factor relates to the age-structure of the population. As stated above, the population of the country was, unlike the population of many LDC's, heavily influenced by migratory movements until after the war. This gave rise to a typical age-

level should be a good approximation of youth unemployment in relation to educational attainment. Table 2 shows the changing pattern quite clearly. Malaysia appears to have 'developed' a pool of relatively well educated unemployed. In 1967/68 the relative frequency of unemployed with a minimum of lower-secondary education was 35 percent but by 1976 the relative frequency had increased to 50 percent. For those with tertiary education the relative frequency rose fourfold, from 0.4 percent to 1.6 percent in the same period.

A host of theoretical reasons have been forwarded to explain educated youth unemployment (see Magnussen 1979). The most common is that of a mismatch between supply and demand. Basically this line of reasoning maintains that the educational system (supply side) does not adequately prepare its graduates for the world of work (demand side). This is also, perhaps, the prevailing view in Malaysia, or at least among the educational authorities (see Ministry of Education 1971). However, as Psacharopoulos (1980) argues, this is a rather simplistic view; if nothing else, it merely restates the problem in different words.

Another economic reasoning comes under the broad label of 'job search'. This maintains that family background (financial structure) and the existing wage structure (plus the cost of job search) might be such as to induce some kinds of graduates to remain unemployed over longer periods relative to others, thus contributing to the overall problem of youth unemployment. In other words, the private rate of return to certain family background and educational qualifications might be sufficiently high to enable certain categories of individuals to 'afford' longer spells of unemployment.

Sociological reasons also exist which suggest that certain graduates might not be prepared to accept any kind of jobs, regardless of the financial returns. The available evidence in Malaysia shows an overall preference for white collar jobs at times when blue collar job vacancies abound (see Department of Statistics 1970, and Mazumdar 1975). Clearly, job attitudes cultivated in school (as distinct from educational training for the world of work) and in the family are important determinants of job search and therefore the problem of youth unemployment.

Another explanation comes under the label of 'credentialism' (or screening). The exponents of credentialism maintain that the sole

Table 2

Unemployment by Educational Level 1967/68 to 1976

Educational Level	1967/68		1974		1975		1976	
	Number	%	Number	%	Number	%	Number	%
Nil	30,099	13.2	41,885	15.7	27,068	10.6	29,194	11.9
Primary	118,155	51.8	110,323	41.2	103,541	40.5	93,875	38.1
Lower Secondary	38,016	16.7	66,717	24.9	65,650	25.7	57,709	23.4
Upper Secondary	25,878	11.3	44,129	16.5	53,218	20.8	55,239	22.4
Pre-University	14,905	6.5	2,934	1.1	3,957	1.5	6,438	2.6
Tertiary	982	0.4	1,503	0.6	2,187	0.9	3,824	1.6

Source: Department of Statistics (1970, Table 54.0.0, p. 122; 1977, Tables p. 7 and p. 29, pp. 21 and 53; 1978, Tables p. 8 and p. 29, pp. 32 and 61; 1980, Tables p. 8 and p. 29, pp. 32 and 61).

purpose of education is that of screening, accompanied by certification, which identifies pre-existing differentials in abilities for employers who would otherwise have no information about the potential productivity of their potential employees (see Berg 1973 and, Taubman and Wiles 1973). Education in effect, so the hypothesis runs, does not add to cognitive and affective skills. The hypothesis suggests that rapid educational expansion will eventually lead only to an upgrading of hiring standards, and where productive capacity does not keep pace this will result in 'educated' unemployment especially for those with lesser educational qualifications.

The final demographic factor, in this context, in effect forms the core of modern Malaysian political and economic life. As stated earlier, the historical development of the country during the colonial era gave rise to a plural society. But, more than this, the historical and cultural development also gave rise to a unique situation wherein the regional, and rural-urban distribution of the population coincides with the ethnic pattern. In 1975 only 18 percent of Malays were residing in urban areas compared with 51 percent of Chinese and 38 percent of Indians. Further, while the non-Malays reside mainly in the more economically developed and industrialised states of Penang, Perak and Selangor (including Kuala Lumpur which now constitutes the Federal Territory), the Malays are most heavily concentrated in the less developed, traditional agriculture states of Kelantan, Perlis and Trengganu. This pattern of population distribution together with differences in the socio-cultural heritages of the three principal ethnic groups spelled unequal opportunities in education, and subsequently in occupational and earnings attainment (see Chai 1964, Parkinson 1967, 1968, and Wilder 1968).

The problems of inter-racial disparities in occupational and earnings attainment are well documented in the five-year development plans (see Malaysia 1971, 1973, 1976 and 1979). The extent of inter-racial disparities in occupational attainment may be seen in Table 3, especially in the managerial, clerical and sales categories. In 1978, only 0.8 percent of Malays were employed as administrative and managerial workers, 6.0 percent as clerical workers, and 5.8 percent as sales workers. For the Chinese the corresponding figures were 2.1, 7.6 and 18.0. At the professional level the extent of the disparities is even

Table 3

Employment by Race and Occupation, 1978

Occupational Category	Malay		Chinese		Indian		Total	
	'000	%	'000	%	'000	%	'000	%
Professional and Technical Workers	116.3	5.8	75.9	5.5	23.1	5.6	219.2	5.7
Administrative and Managerial Workers	16.4	0.8	28.5	2.1	3.1	0.8	49.8	1.3
Clerical Workers	119.3	6.0	105.7	7.6	29.3	7.1	255.9	6.7
Sales Workers	113.2	5.8	249.4	18.0	30.6	7.5	394.3	10.3
Agricultural Workers	1031.2	51.7	299.8	21.6	178.2	43.4	1524.4	39.9
Production, Transport and other Workers	442.6	22.2	513.6	37.0	106.7	26.0	1066.3	33.9
Service Workers	154.8	7.8	116.2	8.4	39.6	9.6	313.0	8.2
Total	1993.8	100.0	1389.1	100.0	410.6	100.0	3822.9	100.0

Source: Malaysia (1979, Table 3.4, p. 47).

greater, as may be seen in the list of selected professional occupations in Table 4. In terms of earnings, the disparities between Malay and non-Malay households is generally in the order of 1:2 in favour of the latter. The available time-series data also point towards an upward, though unspectacular, trend in inter-racial disparities[8]; see Table 5. Between the two principal ethnic groups the disparity ratio increased from 2.15, in terms of mean income, in 1957-58 to 2.49 in 1976, and 1.99 to 2.10, respectively, in terms of median income.

Clearly, in an attempt to raise the quality of life of its people, the government cannot permit the problems of rapid population growth, youth unemployment, and inter-racial disparities to continue unchecked. It would be, in a democratic society, politically impossible to defend a system of declining quality of life, rising unemployment especially among the educated youth, and an increase in inter-racial disparities in a plural society. The socio-economic consequences, including that of national disunity, must call forth change. And these are best seen in the development plans.

III Education and Societal Restructuring

The goals of independent Malaysia's four five-year development plans are more or less similar.[9] At the highest level of the hierarchy, and at the highest level of abstraction, stands the goal of national unity. Although this aim is to be found in most LDC's it has special relevance to Malaysia for the reasons stated above.

On the more tangible level, four principal goals may be found. These goals may be listed as:

a) a more rapid rate of economic growth and development,

b) a lower degree of economic instability,

c) a lower level of unemployment, and

d) a more equitable distribution of income and wealth.[10]

While the first two goals have met with considerable success through a programme of economic diversification and industrialization, the latter two have proven more difficult to attain (see Lim 1973).

There are two basic weaknesses in the development plans. The first lies in the implicit assumptions underlying the economic development strategies, and the second lies in the economic development goals themselves - which are basically by-products of the three demographic factors.

Table 4

Employment by Race in Selected Professional Occupation, 1973
All Malaysia

Occupation	Total Employment	Racial Distribution (Percentage)			
		Malay	Chinese	Indian	Others
Chemists and Physical Scientists	354	11.6	76.8	11.3	0.3
Architects and Town Planners	353	21.0	71.4	2.5	5.1
Engineers	2,244	13.5	69.9	12.8	3.8
Agronomists and other Life Scientists	652	39.1	49.7	8.7	2.5
Veterinarians	162	30.8	24.1	42.6	2.5
Medical Doctors	1,915	7.6	49.5	36.7	6.2
Dentists	379	8.4	66.8	16.1	8.7
Accountants and Auditors	1,774	17.9	70.3	11.0	0.8
Lawyers and Jurists	809	20.3	46.8	29.9	3.0
Higher Education Teachers	1,844	37.5	34.8	16.2	11.5
Managers	12,535	13.0	81.5	3.7	1.8
Government Administrators	10,070	63.2	23.2	11.7	1.9

Source: EPU (1975, Statement 7.3, pp. 84, 85).

Table 5

Income Disparity Ratios, 1957/58 to 1976
Mean (Median)

Ethnic Groups	1957/58	1967/68	1970	1973	1976
Chinese-Malay	2.15 (1.99)	2.14 (2.18)	2.29 (2.23)	2.21 (2.10)	2.49 (2.10)
Indian-Malay	1.71 (1.67)	1.60 (1.59)	1.77 (1.62)	1.68 (1.70)	1.54 (1.59)
Chinese-Indian	1.26 (1.19)	1.34 (1.37)	1.29 (1.38)	1.32 (1.24)	1.62 (1.32)

Note: These ratios are not strictly comparable due to differences in sampling procedures, coverage and definitions of income.

Source: Snodgrass (1975).
Malaysia (1979, Table 3-1, p. 44).

In the formulation of the economic development strategies the government demonstrated an overriding faith in: a) private enterprise as a logical concomitant of political democracy, b) foreign capital investment as an essential ingredient in the process of economic growth, and c) fiscal propriety in terms of a strong currency and a strong external reserve position as a concomitant to foreign capital inflow (see Rudner 1975). In its formulation of the economic goals the government failed to consider the interrelationships between the goals themselves. In the Second Malaya Plan and the First Malaysia Plan the government adopted an ad hoc method of formulating these goals, giving unspecified relative importance to each. It also failed to realise the underlying conflicts between its implicit assumptions and its goals of employment creation and equity, and the potential conflict between maximum current growth, on the one hand, and maximum current employment and equity, on the other hand.

These inconsistencies in the development strategies, and the historical and cultural development of the country which gave rise to the three pertinent demographic factors culminated, in a country characterised by a delicate balance between its major communities, in their own ugly realization. The violent racial riots of May 1969 showed clearly the failure of the development programme of the 1960's to meet the challenges of increasing unemployment and inequalities placed upon the society by the three demographic factors, but more importantly the abstract goal of national unity.

The official diagnosis of the problem of national disunity emphasizes inter-racial economic disparity as the major source of inter-racial conflict.[11] Almost as if to undo the inconsistencies and neglect of decades overnight the government launched its New Economic Policy (NEP) - the substantive content of which is embodied in the Second Malaysia Plan. Briefly, the NEP contains two basic policy goals:

a) the reduction and elimination of poverty irrespective of race, and

b) the restructuring of society so as to reduce and eliminate the identification of race with economic function (implying a reduction of inter-racial inequalities in occupational and earnings attainment).

The New Economic Policy marks a new strategy - a departure from the old system of unordered goals. Now the goals of reducing poverty and inter-racial inequalities rank foremost in the list of policy objectives with the latter appearing as the principal tangible objective and key to national unity - the ultimate abstract goal.

The prescription itself, as contained in the NEP, ascribes to the structural hypothesis rather than the cultural hypothesis of inter-racial inequalities in occupational and earnings attainment. The former emphasizes differences in opportunity while the latter ascribes inter-racial inequalities to underlying cultural differences in values and abilities.[12]

Given this basic prescription (adherence to the structural hypothesis) and the government's commitment to direct action several basic alternative policies are available. Amidst its fiscal, rural development, and urban development policies, the government also lays great emphasis on productivity-raising policies, in particular on education. The latter would, if education is an important determinant of occupational and earnings attainment, at least lead to a narrowing in inter-racial inequalities in occupational and earnings attainment - assuming that education is redistributed in the right direction. Productivity-raising policies with emphasis on education would, it is argued, create fewer direct conflicts than most of the other alternatives in that they merely strengthen the poorer group's ability to compete without intervening directly in the labour market (Snodgrass 1980, pp. 132-139).

The government's commitment to this approach to societal restructuring lies in its belief that "... the lack of education is a major factor adversely affecting the ability of an individual to enhance the quality of his life and to advance his economic position ..." and that the lack of education is "... both a symptom as well as a significant factor contributing toward poverty." Where it is concerned, "... education is a major vehicle for the achievement of the objectives of the New Economic Policy" (Malaysia 1973, p. 189).

IV The Central Questions

The three pertinent demographic factors have given rise to socio-economic consequences which call for change in the structure of Malaysian

society in order, not only to increase the quality of life of the Malaysian people but also, to reduce inter-racial inequalities in occupational and earnings attainment which are officially seen as the core of the problem of national disunity. In this societal restructuring process education ranks foremost among the productivity-raising policy variables. In line with this important role which has been accorded to education the three central issues or questions in this study are as follows:

a) Is education an effective policy variable for raising the standard of living of those who would otherwise be poor? There are two sides to this question. First, education must be judged to be productive, i.e. it must add to both cognitive and affective skills. Education must be more than mere credentialism. Second, education must rank as an important variable vis-a-vis other socio-economic variables in the explanation of earnings differentials.

b) If education is an effective policy variable for raising the standard of living of those who would otherwise be poor, does this imply that it will also be an effective policy variable for reducing inter-racial inequalities in earnings? The basic issue here is whether inter-racial inequalities in earnings are attributable to inter-racial differences in endowments or in their wage determination mechanism. The latter may imply the existence of wage discrimination such that the mere equalization of educational opportunities would prove to be a frustrating means of attaining the desired objective.

c) Is education an effective policy variable for the restructuring of Malaysian society in terms of the elimination of the identification of race with economic function. Here, the problem lies in the different impact which education may have on occupation and occupational mobility between the major ethnic groups. If the marginal impacts are

similar or larger for the disadvantaged group then education would clearly be an effective policy variable.

These are clearly very pertinent questions which demand some answers, and they are particularly important as Malaysia embarks on her second and final decade of the New Economic Policy with ever increasing resources being devoted to education, and without a let down in the socio-economic pressures exerted by the three pertinent demographic factors in sight in the short-run.

V The Data Base

In order to provide some answers to the pertinent questions raised and to consider the effects some demographic variables may have on occupation and earnings attainment, a two-part survey was conducted in the fall of 1978 in order to obtain up-to-date data of the type needed. Details of the sampling methodology and the questionnaire are given in Appendix I. The characteristics of the respondents are given in some detail in a separate study (see Lee 1980, Chapter 3). Here, a statement of the educational and occupational classification schemes employed, the age limit set for the samples, and the bases of sample selection will suffice.

The ten educational levels reflecting the Malaysian educational structure are defined as follows:

a) No formal education

b) Primary - six years of schooling from standard one to six.

c) Lower Secondary - three years from form one to three at the end of which pupils sit for the Sijil Rendah Pelajaran (Lower Certificate of Education).

d) Upper Secondary - two years of schooling from form four to five at the end of which pupils sit for the Sijil Pelajaran Malaysia (Malaysian Certificate of Education).

e)	Pre-University	- two years of lower and upper form six at the end of which pupils sit for the Sijil Tinggi Pelajaran Malaysia (Malaysian Higher School Certificate).
f)	Post-Schooling	- all forms of formal education undertaken after formal schooling, leading to certificates or memberships in such institutions as Pitmans, London Chamber of Commerce, and the City and Guilds London Institute, as well as those from domestic institutions.
g)	College/Professional	- Diploma and professional courses undertaken at commercial, agricultural, teacher training and technical institutions.
h)	Universiti Pertanian and Universiti Teknoloji	- Diploma and degree courses from the University of Agriculture and the University of Technology both of which were elevated from college to university status following the introduction of the New Economic Policy.
i)	University	- all forms of undergraduate courses undertaken at domestic and foreign universities.
j)	Post-Graduate	- covers post-graduate diplomas, Masters, and doctoral degrees, and membership and fellowship of such institutions as the College of Surgeons.

The above classification includes the important but often neglected area of post-schooling education undertaken by large numbers of school leavers, especially those in the urban areas.

In terms of the occupations of the respondents these were recorded at the two-digit level following the International Standard Occupational Classification. In the absence of any well constructed occupational scale for Malaysia the Treiman Standard International Occupational Prestige Scale (Treiman 1977) is adopted. This scale has the advantage in that prestige covers more than earnings. It may of course meet with objections that the scale itself is of an ordinal nature. However, it has been argued that the proper assignment of numeric values to the categories of an ordered metric scale will allow it to be measured as though it were measured at the interval level (see Abelson and Tukey 1970, and Labovitz 1970).

An age limit of forty years was set for the two samples. The principal reason was to ensure that there would be a sufficiently large number of respondents who sat for the Malayan Secondary Schools Entrance Examination conducted between 1956 and 1964. The underlying reason for generating a sufficiently large number of MSSEE candidates was to obtain a measure of 'ability'. Grades obtained at the MSSEE form the proxy measure of endowed ability. This is the best measure available. The importance of standardizing for ability lies in the argument that those with higher endowed ability have (for any given amount of formal education) greater capacity to earn more, and if they also tend to acquire more education than the less able, the failure to account for these differences leads to an overestimate of the gross contribution of formal education and to an understatement of the opportunity cost of foregone earnings for those well endowed with ability (see Becker 1975, Gintis 1971, Hause 1972, and Griliches and Mason 1972).

Three limitations in the use of this proxy variable to represent endowed ability should be noted. First, the examination grades in the main measure cognitive rather than both cognitive and affective skills. Second, this is only a measure of post-schooling ability - with six years of primary schooling - but, in the absence of any measure of pre-schooling ability, this is the best available proxy. Third, examination grades do not necessarily measure the skills and ability needed to succeed in the economic sphere.

Consider next the sampling methodology. In both the private and public sector samples, educational attainment formed the basic basis for the selection of the respondents. In the private sector, firms selected from the establishments in the Business Expectations Survey, First Quarter 1978 list were asked to cooperate by providing respondents in such proportions as to reflect the sex and racial composition of the firms concerned by the specified educational levels, adhering to the specified age limit. Due essentially to time constraint, the selected firms and respondents were confined to those in the Klang valley region - the most economically and industrially developed part of the country. In the case of the public sector, a quota sampling technique was adopted. As far as possible the sample was selected to reflect the sex and racial composition of the employees in the public sector. Basic information on these breakdowns were obtained from the Records Office, Public Services Department.

Part of the intention was to evaluate the productivity and marginal rates of return to various types of tertiary education which may provide clues on the direction for educational expansion at this important level. This explains the bias in the sample in favour of those with higher education. As it turned out, due to the small sample sizes, consistent results could not be obtained and, given the available information, it was not possible to make the analysis model free, i.e. free from sampling biases (see Cochran 1977, pp. 10-11).[13]

For these reasons too, the results reported here are very tentative, and all generalizations, made as a matter of convenience, must be taken as being valid only for these particular samples. All the findings reported here, it is hoped, may be varified in the future in the interest of research, and the attainment of the ultimate Malaysian goal - national unity.

VI Methodology

The human capital school of thought provides a theoretical framework for an analysis of the central issues raised. The concept of human capital and the idea of human capital accumulation is by no means new (see Kiker 1966, and Tu 1969). Though the classicals and neo-classicals did not always fully endorse the concept, they clearly understood it.

The underlying philosophy in the human capital framework is that the capacities or skills with which an individual earns his living are only partly determined by genetic inheritances; the other part comes from a process of acquisition from, inter alia, formal education and training. In other words, the individual may invest in his education and training not only for the sake of present enjoyment, if any, but more so for the sake of future pecuniary and non-pecuniary returns which may accrue to him.

One principal assumption of human capital theory in the analysis of earnings differentials should be noted. In principle it would be possible to estimate the additional earnings which accrues to an individual for that part of his additional skills which are attributed to his education and training by attaching a price to the relevant skills. However, in practice, skills are difficult to define, let alone quantify. It is at this point that the theories of marginal productivity and perfect competition come into play. According to the former, perfectly competitive firms will employ any individual provided the real wage paid to him is less than or equal to his marginal productivity. By equating marginal productivity, and therefore wages, to skills this implies that an individual's earnings are determined not only by his innate abilities but also his acquired cognitive and affective skills, and the latter may be acquired through formal education and training. Given this crucial assumption of perfect competition, human capital theory provides a framework within which the relationship between earnings, occupation, and education, and the effectiveness of education as a policy variable may be examined.[14]

CHAPTER II

THE PRODUCTIVITY AND IMPORTANCE OF EDUCATION

The first issue to be examined here concerns the productivity of education in Malaysia. Unless education is productive in the economic sense, further investment in education may be self-defeating from the point of view of relieving Malaysia's population pressures and easing the problems associated with the need for more rapid economic growth and the need to curb youth unemployment. This is particularly important since education is a long-term investment in human capital. The need to examine the productivity of education also stems from the challenge to the value of education by proponents of the screening hypothesis or credentialism. A related issue concerns the importance of education in determining earnings vis-a-vis other socio-economic variables. For education to be an effective policy variable it must be judged to be both productive and a highly important determinant of earnings.

I The Screening Hypothesis

From the point of view of human capital theory it does not matter whether education adds to cognitive and/or affective skills of the individual. The basic thesis is that it does. This assumption has in recent years come under severe challenge from the proponents of the screening hypothesis (see Berg 1973, and Taubman and Wiles 1973).

The most extreme version of the screening hypothesis states that education does not contribute to superior economic performance.[1] The only purpose of education is that of screening or filtering, accompanied by certification, which identifies pre-existing differentials in abilities for employers who would otherwise have no information about the potential productivity of their employees. Educational certification is the means by which employers sieve out new employees in terms of ability, achievement motivation, and possible family background. In short, employers select applicants in terms of their trainability.

The screening hypothesis does not necessarily imply that education has no value. In the case where different qualities of labour are perfect substitutes in production the net private value of education will be

positive but the social value will always be negative since education is never without some cost. Society will then be better off if the more able would agree not to seek education in an attempt to signal their superior ability to employers. On the other hand, in a more realistic situation where different qualities of labour are not perfect substitutes in production (see Psacharopoulos 1973) education has a positive social value if it improves the allocation of people between jobs. There is however a limit; depending on the cost of education there may be over-investment such that no screening would be better for everyone than the amount provided under competitive equilibrium. But, even if education is free, the theory maintains that it is socially optimal to restrict it so as to improve its screening function.

The implications of the hypothesis are quite serious for those policy makers bent on using education as a policy variable for the reduction of poverty and income inequalities. Initial educational expansion will have a positive social value in terms of its allocative effect, and education can be used as a policy variable for raising the standard of living of those who would otherwise be poor due to their misallocation to jobs in which they are less productive. Beyond this, further indiscriminate expansion is unlikely to have much impact since employers will simply upgrade hiring standards. In fact the whole process may lead to a decline in average productivity due to misallocation of individuals between jobs.

In Malaysia, Mazumdar (1975) provides some evidence in support of the downgrading of occupational attainment of graduates from secondary schools. This and his finding that dropouts earn significantly less than graduates at all schooling levels have been cited as evidence in favour of the argument that Malaysian education, especially at the primary and lower-secondary levels, is unproductive. If this is indeed the case then the provision of more education and the redistribution of educational opportunities in favour of the Malays would be self-defeating.

II Test of the Screening Hypothesis

As Layard and Psacharopoulos (1974) have argued, no direct test of the validity of the screening hypothesis can be performed, and no simple answers can be found, in the absence of precise information on

the set of ability data available to employers, the set of data on ability and other attributes not affected by education, and individual marginal productivities. It is therefore necessary to resort to indirect tests by examining the validity of the predictions of the hypothesis.

The test here deals not with the weak version of the hypothesis with which few would disagree but with the strong version of the hypothesis. According to the former, employers offer relatively higher starting wages to the more educated in the absence of any other information on the employee's productivity. Employers will continue to pay more to the higher educated employees over time since education is not only a screen but it is also productive. According to the strong version rational employers will pay the more educated higher starting wages but will adjust downwards the wages of the more educated (but not more productive) relative to the less educated (but equally productive) over time. These situations may be illustrated by the convergence or divergence of the experience-earnings profiles as in Figure 1. The dotted lines show the case of the strong version of the screening hypothesis; the profiles tend to converge (or diverge less steeply) with experience since the initial hiring mistakes in terms of expected productivity are gradually corrected.

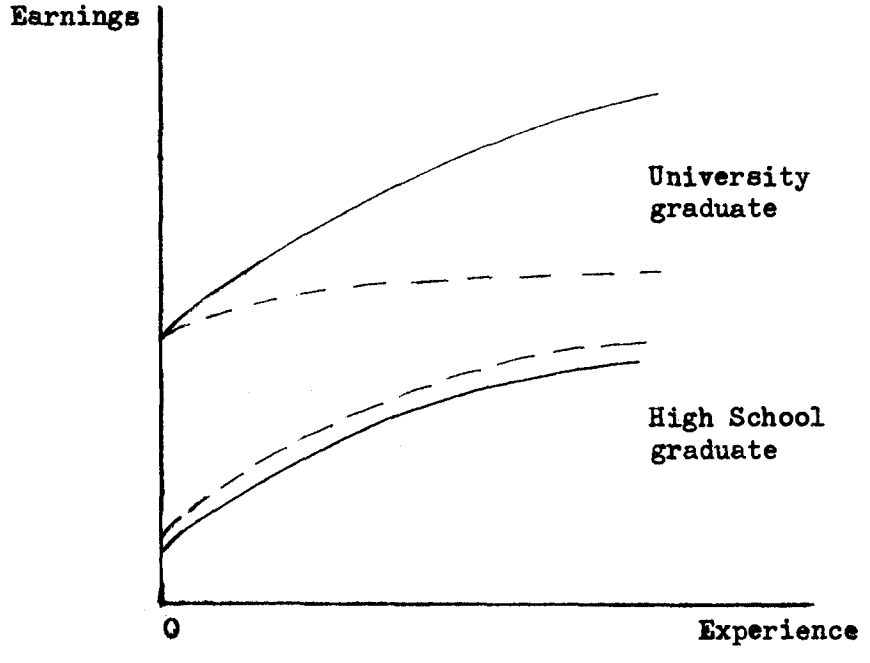

Figure 1: Screening and Experience-Earnings Profiles

The key to the test lies, as Psacharopoulos (1980) suggests, in the distinction between the competitive and the non-competitive sectors of the economy. Since governments are not profit maximizers and can produce any output of public services that Parliament approves, it is the obvious choice for the non-competitive component of the test. The private sector, on the other hand, consisting of profit (or sales or growth) maximizing firms which operate on an economic rationale, is the obvious choice for the competitive component. Wages in the private sector are more likely to be determined by the marginal productivity of labour than they are in the public sector. Private sector employers can be expected to conduct 'on-the-job screening', adjusting the wages of their employees accordingly. On the other hand, employees in the public sector are less likely to undergo 'on-the-job screening'; their wages more often than not progress along pre-determined pay scales which are normally directly related to paper qualifications, such as in Malaysia (see Cabinet Committee 1977).

The attempt to compare wage structures in the two sectors might meet with an objection. In most countries, Malaysia included, anything from one-third to two-thirds of all highly qualified manpower is employed in the public sector. It might be argued that the public sector has a tendency to force artificially high pay scales on the private sector, especially in LDC's, so any comparison of wages between the two sectors and, more importantly, any attempt to link wages with marginal productivity will be tenuous since a concept such as marginal productivity lacks content in the public sector. If this is indeed the case, then the correlation between wages and education cannot be equated with the correlation between marginal productivity of labour and education which lies at the heart of the argument.

Fortunately, this is not the entire case in Malaysia. In the last report on public sector salaries the government emphasizes its reluctance and inability to match wages in the private sector for highly qualified manpower (see Cabinet Committee 1977, pp. 14-15). Since the private sector does pay highly qualified manpower above the pay scales in the public sector, the marginal productivity of labour in the private sector remains a key element in determining actual wage structures. However, as Blaug (1972, p. 62) remarks, the high proportion of qualified people

employed by the government reduces the confidence one may have in the competitive model of professional labour markets.

III The Empirical Results[2]

The basic test itself lies in a comparison between two earnings functions, i.e. the private and public sector earnings functions. Assuming that the labour market is perfectly competitive so that wages reflect the value marginal product of labour, and that there are no inequalities in ability, physical skills, socio-economic background, and access to the capital market so that everyone has the same opportunities, the simple earnings function may be stated as:

$$(1) \quad \ln Y_s = \ln Y_o + rs$$

where $\ln Y_s$ = the natural logarithm of earnings of the individual with some schooling;

$\ln Y_o$ = the natural logarithm of earnings of the individual with no schooling;

s = the difference in the length of schooling between the two individuals;

and r = the rate of return to schooling.

This shows that the percentage increments in earnings are strictly proportional to the absolute differences in the length of schooling, with the rate of return to schooling as the proportionality coefficient. More precisely, the natural logarithm of earnings is a linear function of the length of formal schooling (see Mincer 1974, pp. 7-11).

This simple schooling model does not score well with reality since most individuals do continue to invest in themselves after their period of formal education. Individuals continue to develop their skills and earning capacity and these are usually acquired on the job; i.e. in the form of general and/or specific on-the-job training (see Becker 1962). Then, assuming that the ratio of post-schooling investment declines linearly and reaches zero at some period T, i.e. $K_t^p(t) = K_o^p(1 - t/T)$, this enables one to write the basic Becker-Chiswick-Mincer earnings function as follows:

$$(2) \quad \ln Y_t^r = b_o + b_1 s + b_2 t + b_3 t^2 + u$$

where $b_o = \ln Y_o^g - k_o^p \left(1 + \frac{k_o^p}{2}\right)$

$b_1 = r$

$b_2 = \left[\rho k_o^p + \frac{k_o^p}{T}\left(1 + k_o^p\right)\right]$

$b_3 = -\left[\frac{\rho k_o^p}{2T} + \frac{(k_o^p)^2}{2T^2}\right]$

Y_t^r = net (actual) earnings at experience t,

Y_t^g = gross (potential) earnings at experience t,

k_t^p = investment ratio during post-schooling years (< 1),

r = rate of return to schooling,

ρ = rate of return to post-schooling investment,

s = length of schooling,

and t = years of work experience.

This is amenable to empirical analysis using linear regression techniques (see Mincer 1974, Becker 1975, and Becker and Chiswick 1966).[3]

Two further extensions of the basic test are made here. First is the introduction of interaction terms which permit more than casual observation of the convergence or divergence of the experience-earnings profiles.[4] Second, since the higher returns to higher education may be no more than a reflection of the superior ability of those with higher education - i.e. screening has been performed efficiently - an attempt must be made to control for differences in ability.

Table 1 presents the earnings functions for the two sectors. The level of education is measured in terms of highest educational qualifications as set out in the previous chapter. Three salient features of earnings functions may be noted here. First, the variables used together explain up to four-fifths of earnings differentials in both sectors. Second, the coefficients of the educational qualifications dummy variables show clearly

Table 1

Earnings Functions by Economic Sector

Independent Variable	Private	Public
Constant	5.116	5.455
Lower secondary	0.135[b] (2.993)	0.202[b] (2.845)
Upper secondary	0.475[b] (11.318)	0.400[b] (4.947)
Post-schooling	0.533[b] (10.995)	0.378[b] (5.297)
Sixth form	0.766[b] (14.349)	0.635[b] (8.071)
College/professional	1.335[b] (22.703)	0.869[b] (12.911)
University	1.800[b] (30.024)	1.484[b] (21.758)
Post-graduate	2.006[b] (21.351)	1.502[b] (21.591)
Years of experience, t	0.037[c] (2.389)	0.041[b] (4.285)
t^2	-0.0002 (0.202)	0.0004 (0.546)
Years of schooling x t, St	0.007[b] (5.284)	0.002[c] (2.517)
St^2	-0.0002[b] (2.756)	-0.0001[c] (2.392)
$\bar{R}^2$	0.800	0.787
N	1178	781

[a]Dependent variable is natural logarithm of monthly earnings.

[b]Significant at 0.01 level.

[c]Significant at 0.05 level.

that the returns to education are generally higher in the competitive (private) sector than in the non-competitive (public) sector.[5] This implies that the competitive sector places a higher value on higher education than the non-competitive sector even after the employees have been subject to 'on-the-job screening'. Third, and perhaps the most important feature here, the coefficient of St is positive and significant in both sectors, but its absolute value in the competitive sector is at least three times that in the non-competitive sector, showing that though the experience-earnings profiles diverge in both sectors they do so much more in the sector where productivity matters. The test for the equality of the two sets of coefficients shows that they differ significantly at the 1 percent level; F-ratio = 16.694.

It may of course be argued that screening has been performed efficiently so that the higher returns to higher education may be no more than a reflection of the superior ability of those with higher education. In reply to this, earnings functions are estimated for the two sub-samples of respondents who sat for the MSSEE.[6] Ability is here measured by a rank ordering of MSSEE grades.[7] Three salient features of the regression equations in Table 2 may be noted. First, the coefficients of St are all positive - though they are smaller than for the complete samples due to the narrower range of work experience of the respondents - showing no tendency for the experience-earnings profiles to converge in either sector. Second, the results show that, even after controlling for 'ability' the rates of return to schooling are still higher in the competitive sector than in the non-competitive sector. Third, the competitive sector provides higher returns to 'ability' - more than twice as much - than the non-competitive sector. Test for the equality of the two sets of coefficients again led to a rejection of the null-hypothesis; F-ratio = 21.482.

What the above means is that in the case where productivity is likely to matter, more education continues to have a value even after controlling for experience, and this holds even among employees who have been certified to be equally able (at least in cognitive terms). The test here produced results which are inconsistent with the strong version of the screening hypothesis. The indications are that education is valued more highly in the competitive (private) sector than in the

Table 2

Earnings Functions with Ability Variable by Economic Sector

Independent Variable	Private	Public	Private	Public
Constant	5.226	5.513	4.982	5.552
Lower secondary	0.232[c] (2.634)	0.262[d] (1.959)	0.170[d] (1.951)	0.240[d] (1.807)
Upper secondary	0.583[b] (7.054)	0.453[b] (3.408)	0.483[b] (5.746)	0.427[b] (3.234)
Post-schooling	0.622[b] (6.341)	0.307[b] (2.861)	0.508[b] (5.108)	0.385[b] (2.796)
Sixth form	0.813[b] (7.462)	0.575[b] (3.832)	0.691[b] (6.285)	0.525[b] (3.510)
College/professional	1.333[b] (11.606)	0.792[b] (5.727)	1.203[b] (10.346)	0.774[b] (5.633)
University	1.804[b] (14.541)	1.270[b] (8.446)	1.647[b] (13.033)	1.226[b] (8.180)
Post-graduate	2.028[b] (13.037)	1.259[b] (8.194)	1.860[b] (11.856)	1.219[b] (7.967)
Years of experience, t	-0.021 (0.468)	-0.117[b] (3.360)	-0.005 (0.107)	-0.105[b] (3.031)
t^2	0.004 (1.367)	0.009[b] (3.911)	0.003 (1.006)	0.008[b] (3.679)
Years of schooling x t, St	0.010[b] (3.069)	0.011[b] (4.318)	0.008[b] (2.600)	0.009[b] (4.058)
St^2	-0.0005[b] (2.171)	-0.0006[b] (3.397)	-0.0004[d] (1.786)	-0.0006[b] (3.235)
Ability			0.116[b] (4.513)	0.051[b] (2.929)
$\bar{R}^2$	0.760	0.719	0.769	0.724
ANOVA F-ratio			20.369	8.578
N	482	469	482	469

[a]Dependent variable is natural logarithm of monthly earnings

[b]Significant at the 0.01 level.

[c]Significant at the 0.05 level.

[d]Significant at the 0.10 level.

non-competitive (public) sector. In Malaysia, education must have an inherent productive value.

There is however the problem of the lower marginal rate of return to lower-secondary education in the competitive sector than in the non-competitive sector. This is coupled with the problem of educated youth unemployment in the midst of substantial vacancies for blue-collar jobs. In the midst of educated youth unemployment, registered new vacancies for blue-collar jobs accounted for over three-quarters of all registered new vacancies at the end of 1979 (see Department of Statistics 1980, Table 9.13, p. 189). The problem does not appear to lie in the possibility that education at the lower-secondary level is unproductive in that it does not add to cognitive and affective skills. The problem appears to lie in the cultivation of attitudes and the continuance of a wage structure which favours white-collar employment (see for instance Mazumdar 1975, and Department of Statistics 1980, Tables 9.6 to 9.8, pp. 182-184).

IV The Importance of Education in Earnings Differentials

Though education may have a productive value, it must also be an important determinant of earnings differentials if it is to serve effectively as a policy variable for the reduction and elimination of poverty. In other words, for education as a productivity-raising device to be an effective policy variable in terms of the reduction, at the very least, of inequality in labour earnings it must rank as one of the more important determinants of income, vis-a-vis other socio-economic variables.

In order to examine the importance of education as a determinant of earnings differentials, a structural form earnings function may be specified as follows:

$$(3) \quad \ln Y = f(E, Q, N, M, P, B) + u$$

where lnY is the natural logarithm of earnings, E is a vector of educational qualifications, Q is the vector of quality of education variables, N is a vector of employment variables, M the vector of demographic or motivational variables, P the vector of personal characteristics variables, and B the family background variables vector.[8]

The final list of variables in the structural equation of the expanded human capital model is shown in Table 3 below.

Table 3

List of Characteristics Variables

	Variables	Description
I	**Education Variables**	
	1. Educational Qualification	Dummy variables for highest educational qualification E_1 = 1 if Lower Certificate of Education or equivalent E_2 = 1 if Malaysian Certificate of Education or equivalent E_3 = 1 if post-schooling qualification E_4 = 1 if Higher School Certificate or equivalent E_5 = 1 if college qualification E_6 = 1 if graduate of Universiti Pertanian or Universiti Teknoloji E_7 = 1 if graduate of other universities E_8 = 1 if post-graduate
II	**Quality of Education**	
	1. Language of Instruction at School	Dummy variables for medium S_m = 1 if Malay medium S_e = 1 if English medium
	2. Status of School	Dummy variables for school type S_g = 1 if fully government school S_a = 1 if government aided school
	3. Location of School	Dummy variables S_c = 1 if located in the cities and municipalities of Kuala Lumpur, Penang, Petaling Jaya, Ipoh, Johor Bahru, and Melaka Town S_t = 1 if located in other state or district capitals S_u = 1 if other urban areas

cont'd

	Variables	Description
III	Employment Characteristics	
	1. Formal Training	Dummy variable FT = 1 if the individual received some form of formal training within the firm, e.g. training organised within the firm, in specialized training institution, apprenticeship, and overseas training
	2. Union Membership	Dummy variable: UNION = 1 if the individual is a union member
	3. Establishment Size	FIRMSIZE = estimated number of employees within the establishment
	4. Ownership	Dummy variable: FOREIGN = 1 if the establishment is foreign owned or controlled
	5. Sector of Employment	Dummy variables applicable to the private sector sample only MANUF = 1 if manufacturing CONST = 1 if construction RETAIL = 1 if retail trade WSALE = 1 if wholesale trade FINAN = 1 if financial sector
	6. Job Quits	QUITS = number of employers excluding the present employer since first fulltime employment
IV	Demographic or 'Motivational' Variables	
	1. Marital Status	Dummy variable: MARRIED = 1 if married
	2. Number of Dependents	NODEP = total number of people dependent on the individual for financial support
V	Personal Characteristics	
	1. Sex	Dummy variable: MALE = 1 if the individual is of the male sex
	2. Race	Dummy variables MALAY = 1 if Malay or other natives CHINESE = 1 if the individual is of Chinese descent

cont'd

Variables	Description
VI Family Background	
1. Mother's Education	Dummy variable for the highest educational level attended ME_1 = 1 if primary education ME_2 = 1 if secondary education ME_3 = 1 if tertiary education
2. Mother's Occupation	Dummy variables for occupational level MO_1 = 1 if mother is in senior executive, professional, or junior executive position MO_2 = 1 if in supervisory, skilled, clerical or sales categories MO_3 = 1 if in service, production, or miscellaneous occupations
3. Father's Education	Dummy variable for the highest educational level attended DE_1 = 1 if primary education DE_2 = 1 if secondary education DE_3 = 1 if tertiary education
4. Father's Occupation	Dummy variable for occupational level DO_1 = 1 if senior executive, professional or junior executive DO_2 = 1 if supervisory, skilled, clerical or sales worker DO_3 = 1 if father is a production or service worker
5. Family Size	FAMSIZE = total number of children in the family
6. Sibling Position	Dummy variable: FLBCHILD = 1 if the individual is a first or last born child
7. Childhood Environment	Dummy variables CE_1 = 1 if major city or municipality CE_2 = 1 if other state or district capital CE_3 = 1 if other urban area

From the estimates of the structural equation above, the relative importance of each of the independent variables may be compared by standardizing the regression coefficients. The variables are standardized to have unit variance (i.e. the standard deviations of the variables = 1) in order to permit a comparison of variables which are measured on different units. Standardized regression coefficients, also referred to as beta weights, provide the only sensible way to compare the relative effect on the dependent variable (the natural logarithm of monthly earnings in this case) of each independent variable (given in Table 3 above).[9]

V The Empirical Results

The structural form earnings function estimated here can be thought of as the conditional expectation of (the log of) earnings, given the individual's present socio-economic condition. Table 4 presents the regression estimates together with a rank ordering of the variables in terms of their relative effect on the dependent variable as given by the beta weights.

Several interesting and significant results emerge from the addition of the characteristics variables (apart from the dummy variables in educational qualifications, E_i, and the actual full-time work experience variable, t) to the earnings function. First, the resulting F-ratios show significantly high overall goodness of fit in both cases, i.e. in the case of the private and public sectors (see Table 4). In both cases the independent variables account for over four-fifths of the variations in earnings.

Almost all the educational qualification variables produce results which are significant at the 1 percent level. The apparent exception is the dummy variable for the Lower Certificate of Education (E_1) showing that the rates of return to the LCE are not significantly different from those of a primary education in both the private and public sectors.

The actual work experience variable, t, and the interaction terms in S (length of formal education) and t do on the whole produce the expected results. The important point here is the positive and significant regression coefficient for the interaction term St in

Table 4

Regression Estimates of Earnings Functions:
Structural Form

Sector	Private		Public	
Regression Number	4.1	Rank	4.2	Rank
Constant	4.907		5.211	
E_1	0.006 (0.147)		0.108 (1.568)	
E_2	0.267[a] (6.630)	8	0.316[a] (4.746)	8
E_3	0.365[a] (7.757)	7	0.304[a] (4.334)	10
E_4	0.495[a] (9.064)	6	0.556[a] (7.075)	9
E_5	0.983[a] (16.656)	2	0.826[a] (11.976)	3
E_6	n.a.		1.100[a] (10.906)	7
E_7	1.429[a] (23.703)	1	1.353[a] (19.396)	1
E_8	1.580[a] (17.590)	4	1.402[a] (19.521)	2
t	0.040[a] (2.656)	5	0.039[a] (4.245)	6
t^2	-0.001 (1.409)		0.0004 (0.573)	
St	0.005[a] (3.649)	3	0.002[a] (2.659)	4
St^2	-0.0001 (1.303)		-0.0001[a] (2.587)	5
S_m	-0.201[a] (3.577)	12	n.a.	
S_e	-0.014 (0.273)		0.119[a] (4.505)	13

cont'd

Sector	Private		Public	
Regression Number	4.1	Rank	4.2	Rank
S_g	0.050[b] (1.605)	27	0.064[b] (2.242)	16
S_a	0.072[b] (2.155)	24	0.097[a] (2.928)	14
S_c	0.129[a] (2.184)	13	0.056 (1.444)	
S_t	0.108[b] (1.922)	17	0.033 (0.909)	
S_u	0.131[b] (2.134)	21	n.a.	
FT	0.082[a] (3.692)	19	0.113[a] (5.483)	11
UNION	-0.076[a] (2.924)	20	n.a.	
FIRMSIZE	0.0001 (1.364)		n.a.	
FOREIGN	0.171[a] (7.280)	9	n.a.	
MANUF	-0.053 (1.035)		n.a.	
CONST	-0.076 (1.132)		n.a.	
RETAIL	-0.038 (0.594)		n.a.	
WSALE	0.147[a] (2.716)	16	n.a.	
FINAN	0.079 (1.393)		n.a.	
QUITS	-0.034[a] (4.003)	18	-0.044[a] (3.424)	15
MARRIED	0.118[a] (4.541)	14	0.026 (1.138)	

cont'd

Sector	Private		Public	
Regression Number	4.1	Rank	4.2	Rank
NODEP	0.015[a] (2.879)	23	0.003 (0.632)	
MALE	0.122[a] (4.980)	15	0.112[a] (5.628)	12
MALAY	0.147[a] (4.092)	11	0.038 (1.319)	
CHINESE	0.160[a] (4.686)	10	0.039 (1.365)	
ME_1	-0.047[c] (1.847)	28	0.001 (0.092)	
ME_2	0.054 (1.362)		0.094[a] (2.665)	17
ME_3	-0.134 (1.099)		0.221[b] (2.352)	18
MO_1	0.045 (0.577)		-0.037 (0.562)	
MO_2	-0.073 (1.086)		-0.062 (0.918)	
MO_3	-0.101[b] (2.558)	26	-0.025 (0.627)	
DE_1	0.009 (0.354)		0.026 (1.139)	
DE_2	0.080[a] (2.499)	22	-0.028 (0.981)	
DE_3	0.121[b] (2.090)	25	0.037 (0.759)	
DO_1	0.046 (0.936)		0.058 (1.215)	
DO_2	-0.006 (0.140)		0.038 (0.910)	
DO_3	-0.006 (0.190)		0.016 (0.407)	

cont'd

Sector	Private		Public	
Regression Number	4.1	Rank	4.2	Rank
FAMSIZE	0.0005 (0.135)		-0.005 (1.313)	
FLBCHILD	-0.005 (0.240)		-0.002 (0.078)	
CE_1	0.009 (0.231)		-0.056[c] (1.814)	18
CE_2	-0.00002 (0.001)		-0.024 (0.880)	
CE_3	0.013 (0.286)		-0.015 (0.367)	
$\bar{R}^2$	0.843		0.815	
F-ratio	127.369[a]		85.700[a]	
N	1174		790	

Dependent variable is natural logarithm of monthly earnings.
Figures in parentheses are t-ratios.
n.a. = not applicable.

a: significant at the 0.01 level
b: significant at the 0.05 level
c: significant at the 0.10 level

both sectors. Again, this shows that the experience-earnings profiles tend to diverge rather than converge as might be expected under the strong version of the screening hypothesis.

The set of dummy variables representing the three dimensions of school quality produces some interesting and significant results. In the case of the private sector sample they show that employees who had their final schooling in the Malay medium earn, on the average, 22 percent less than those from the Chinese medium schools. On the other hand, employees with English medium schooling have no significant advantage over those from the Chinese medium. It appears that employees with Malay medium schooling, independent of their educational attainment, school quality, experience and other characteristics, suffer a disadvantage in the labour market in the private sector. This disadvantage may be attributed to the

fact that the lingua franca of the urban and modern private sector, is English and Chinese. In the case of the public sector, those with English medium education earn, on the average, 13 percent more than those from other language mediums. This is not completely unexpected since those with English medium schooling tend, on the whole, to be employed at the higher levels of the job hierarchy.

Employees from government schools earn about 5 percent more than those from private schools, and about 2 percent less than those from government-aided (mainly missionary) schools in the case of the private sector sample. The corresponding percentage for the public sector, over and above those from private schools, are 6 and 10. These show a difference in the quality of these schools vis-a-vis the private schools or rather the superior ability of those who complete their schooling in government and government-aided schools. It is common knowledge that government and government-aided schools are generally of superior quality to the private schools (though some Chinese private schools are also of high quality), and that pupils normally seek entrance into private schools as a 'last resort'.

In terms of the locational factor of the school, significant results arise only in the case of the privare sector sample. The coefficients are all positive and significant showing that those from schools in the city (cities and municipalities), towns (state and district capitals), and other urban areas earn about 11 to 14 percent more than those from rural schools. This can be taken as a clear reflection of the superior quality of urban schools over rural schools (see Ministry of Education 1974, pp. 32-37).

Turning to the employment characteristics, the similarities between the private and public sectors lie in the returns to formal training, FT, and to job turnover, QUITS. In both sectors formal training has a positive return - in the private sector employees with formal training earn about 8.5 percent more than those without an equivalent training, and in the public sector the corresponding figure is 12.0 percent.[10] On the other hand, in both sectors, job turnover has a negative impact on earnings. These would suggest either discrimination against those with unstable work patterns or that those with unstable work patterns lose out in terms of seniority. In the private sector, those employed by foreign firms earn, on the average, 18.6 percent more than those

employed by domestic firms, showing that foreign firms do provide better wages and fringe benefits as might be expected. Employment sector dummy variables produce only one significant result. Employees in the wholesale sector earn about 15.8 percent more than those in the primary sector. The results seem, on the whole, to coincide with the incidence of poverty across employment sectors than with sectoral differences in value added per worker (see Lee 1980, pp. 190-191).

In terms of the demographic factors which may also be referred to as proxy variables for motivation, significant results emerge only in the case of the private sector. Married employees earn about 12.5 percent more than their unmarried counterparts, and those with dependents have a positive marginal return of about 1.5 percent. The insignificant results in the case of the public sector reflect the fact that wages in the public sector tend, on the whole, to follow predetermined salary scales.

The results also show the significance of sex and inter-racial differentials in earnings. In both sectors males earn more than females - 13.0 percent in the case of the private sector and 11.9 percent in the public sector. Inter-racial differentials appear only in the case of the private sector, with the Chinese having the greatest advantage - 17.4 percent over the Indians - followed by the Malays with a 15.8 percent advantage over the Indians.

Family background variables produce few significant results which tend, on the whole, to be positive. In both the private and public sectors parental education plays significant roles in the determination of earnings though they differ somewhat between employees in the two sectors.

The important point here concerns the relative importance of the explanatory variables in predicting personal earnings. As stated above, the relative importance of the variables may be examined by a rank ordering of their beta weights. These rankings are given alongside the regression coefficients in Table 4. As may be seen, with the exception of a lower-secondary educational qualification, the education variables rank among the top ten most important determinants of earnings differentials in both sectors. The full-time experience variables, in particular t and St, also rank among the more important variables. Together, these show the importance of the two basic human capital variables - education and

actual full-time work experience - in the explanation of observed earnings differentials in both the private and public sectors. In the case of the latter this is to be expected given the fact that public sector earnings tend, on the whole, to follow predetermined salary scales which are often based on educational qualifications and experience (see Cabinet Committee 1977). In the case of the private (competitive) sector this must clearly reflect on the inherent productive value of both education and experience.

VI Concluding Remarks

The empirical results presented here render support to the argument that Malaysian education has an inherent productive value, and that education is an important determinant of earnings differentials in Malaysian society. It appears that education can be an effective productivity-raising variable which may be used quite successfully in the battle against poverty. It should however be noted that, following the arguments of the screening hypothesis, indiscriminate expansion of educational supply is not called for. The extremely low marginal rates of return to lower-secondary education coupled with the problem of youth unemployment should be grounds for considerable concern among the educational authorities and the government as a whole. There is a need to examine attitude formation and the existing wage structure which discourages youths from blue-collar employment.

CHAPTER III

RACIAL EARNINGS DIFFERENTIALS

Inter-racial earnings differentials which are so well documented in the Second and Third Malaysia Plans may be attributed to inter-racial differentials in earnings characteristics (or endowments) and to inter-racial differentials in earnings determining mechanism (or earnings *structures). From a policy viewpoint the failure to examine the underlying* factors contributing towards such differentials represents a serious gap in knowledge in the attempts to reduce inter-racial earnings inequalities. If differences in earnings are due mainly to differences in educational endowments then clearly the provision of more and better education to the disadvantaged group(s) would be a step in the right direction. This is particularly so if education has an inherent productive value and is an important determinant of earnings differentials. On the other hand, differences in earnings may be due to differences in earnings determining processes, and this would call for further research into supply and demand conditions, the importance of such factors as the ability to succeed in the economic sphere and motivation which are not adequately covered in this study, and any 'discriminatory' practices which may result from adherence to a cultural hypothesis of inter-racial earnings disparities.[1]

I The Analysis of Earnings Differentials

Following the human capital framework, an individual's earnings may be related to past human capital investment as follows:

$$(1) \quad \ln Y_i = b_o + \sum_{j=1}^{n} b_j X_j + u_i$$

Then, for any two groups, estimates of separate structural forms of the earnings function can be made:

$$(1a) \quad \ln Y_i^1 = b^1 + \sum_{j=1}^{n} b_j^1 X_j^1 + u_i^1$$

$$(1b) \quad \ln Y_i^h = b_o^h + \sum_{j=1}^{n} b_j^h X_j^h + u_i^h$$

where the superscripts 1 and h refer to the low-wage group (LWG) and high-wage group (HWG) respectively.

Here, the question to be considered is how much of the differential in monthly salary, say, of the two groups is due to differences in their earnings related characteristics and how much to differences in their wage structures. The second difference can be related not only to discrimination, as is commonly done in the West (see Oxaca 1973, and Malkiel 1973), but also to differences in supply and demand conditions (see Lee and Lee 1981).

To control for differences in both earnings related characteristics and in earnings determining processes of the two groups, standardization procedures are used here. The impact of these differences on the actual difference in earnings can be seen by comparing the adjusted ratios to the unadjusted ratio of LWG-HWG earnings.

The first standardization is in terms of earnings related characteristics, or endowments. This implies giving the LWG the endowments of the HWG but retaining the earnings structure of the LWG. This gives the endowment adjusted earnings differential. If the initial earnings functions are $Y^h = b^h X^h$ and $Y^l = b^l X^l$, then this standardization is achieved by estimating $Y^l_a = b^l X^h$, and the endowments adjusted earnings ratio is given by Y^l_a / Y^h.

The second standardization is in terms of the earnings determining processes (coefficients). Here, the LWG retains its existing endowments but is given the earnings coefficients of the HWG. This gives the coefficients adjusted earnings differentials. Again, if the earnings functions of the groups are as above then this standardization is achieved by estimating $Y^l_b = b^h X^l$, and the coefficients adjusted earnings ratio is given by Y^l_b / Y^h.

In fact, given equations (1a) and (1b) wage differentials between the groups may be decomposed as follows:

$$\bar{Y}^h - \bar{Y}^l = b^h_o - b^l_o + \sum_{j=1}^{n} b^h_j \bar{X}^h_j - \sum_{j=1}^{n} b^l_j \bar{X}^l_j$$

$$= b^h_o - b^l_o + \sum_{j=1}^{n} b^h_j (\bar{X}^h_j - \bar{X}^l_j) + \sum_{j=1}^{n} X_j (b^h_j - b^l_j)$$

where $b_o^h - b_o^l$ is the portion of the differential captured by the shift coefficient, which though typically attributed to discrimination (see Thurow 1969) may be attributed to differences in supply and demand conditions (see Lee and Lee 1981). The second term on the R.H.S. is the value of the advantage in endowments possessed by the HWG as evaluated by the HWG's wage equation.[2] The third term is the difference between how the high-wage equation would value the characteristics of the LWG and how the low-wage equation actually values them. Following Blinder (1973), the second term refers to differentials attributable to endowments, and the third term to differentials attributable to coefficients or hiring practices. In the Malaysian case, the shift coefficient itself is best referred to as a premium for score factors omitted from the equations (see Lee and Lee 1981).

These measures of the differentials may be summarised as follows:

R = raw differential

$$= b_o^h + \sum_{j=1}^{n} b_j^h \bar{X}_j^h - (b_o^l + \sum_{j=1}^{n} b_j^l \bar{X}_j^l)$$

$$= E + C + U$$

E = portion of differential attributable to differing endowments

$$= \sum_{j=1}^{n} b_j^h (\bar{X}_j^h - \bar{X}_j^l)$$

C = portion of differential attributable to differing coefficients

$$= \sum_{j=1}^{n} \bar{X}_j^l (b_j^h - b_j^l)$$

U = unexplained portion of differential

$$= b_o^h - b_o^l$$

P = portion of differential attributable to supply and demand conditions and omitted factors

$$= C + U$$

II Private Sector Inter-racial Wage Differentials

This section breaks down the raw inter-racial differentials for males and females in the private sector into their component parts, using the procedure outlined above. The regression coefficients upon which the following analysis is based are provided in Appendix II. The following independent variables are used in the structural form of the earnings functions:

I Education Variables

1. Formal Education	S = years of formal education in full-time equivalents including post-schooling education
2. Language of Instruction	Dummy variable: S_e = 1 if English medium
3. Status of School	Dummy variables: S_g = 1 if government school; S_a^g = 1 if government-aided
4. Location of School	Dummy variable: S_c = 1 if located in the city or municipality

II Employment Variables

1. Experience	t = years of actual full-time work experience
2. Formal Training	Dummy variable: FT = 1 if the individual received some form of formal training provided by the firm
3. Union Membership	Dummy variable: UNION = 1 if union member
4. Ownership	Dummy variable: FORFIRM = 1 if firm is foreign owned or controlled
5. Establishment Size	FIRMSIZE = estimated number of employees in the firm
6. Sector of Employment	Dummy variables: TERSECT = 1 if tertiary sector; SECSECT = 1 if secondary sector
7. Job Quits	QUITS = number of employers excluding present employer since first full-time employment

III 'Motivation' Variables

1. Marital Status	Dummy variable: MARRIED = 1 if married
2. Number of Dependents	NODEP = total number of people dependent upon the individual for financial support

IV Family Background

1.	Mother's Education	MED = number of years of formal education of the respondent's mother
2.	Mother's Occupation	MOC = occupational prestige score of the mother's occupation based on the Treiman scale
3.	Father's Education	FED = number of years of formal education of the respondent's father
4.	Father's Occupation	FOC = occupational prestige score of the father's occupation based on the Treiman scale
5.	Childhood Environment	Dummy variable: CE_1 = 1 if the individual grew up in the city or municipality
6.	Family Size	FAMSIZE = total number of children in the family
7.	Sibling Position	Dummy variable: FLBCHILD = 1 if individual is first or last born child

The analysis here is conducted in terms of monthly salary.[3] An obvious advantage in the choice of monthly salary as opposed to monthly earnings is that it is subject to fewer changes from month to month than the latter, which may be affected by overtime compensation and variations in travel and food allowances, as well as variations in annual bonuses.

The average monthly salary of Malay male employees in the private sector sample is $641.53 compared with Chinese male employees' average of $968.75 and an average of $519.22 for Indian male employees. These averages are somewhat higher than might be expected due to the bias in the sample in favour of the more highly educated employees. Here, the unadjusted male Malay-Chinese, Indian-Chinese, and Indian-Malay salary ratios are 0.633, 0.537 and 0.849, respectively.[4]

The impact of differences in endowments on earnings characteristics, and wage structures of males from the three ethnic groups on their salary differentials can be examined using the regression estimates given in Appendix II. The endowments adjusted Malay-Chinese (MC), Indian-Chinese (IC), and Indian-Malay (IM) salary ratios are 0.900, 0.859, and 0.969, respectively. Differences in endowments among the males in the private sector sample do account for a substantial part of salary differentials between the three ethnic groups. Standardization for differences in

wage determining processes - coefficients - produces somewhat similar results; the coefficients adjusted MC, IC, and IM salary ratios are 0.882, 0.822, and 0.908, respectively.

In order to determine the relative importance of differences in endowments and in wage structures (coefficients) on salary differentials the raw differentials implied by the structural equations may be decomposed into the portion attributable to differing coefficients.

Table 1 shows the decomposition of the overall 69.62 percentage salary advantage of Chinese males over their Malay counterparts in the manner implied by the structural estimates. The independent variables account for a 79.09 percent differential in favour of the Chinese on the basis of the 'objective' characteristics, leaving a 9.50 percent advantage for the Malays to the unexplained shift coefficient. At this point it should be noted that the test of equality between the two sets of coefficients led to a rejection of the null hypothesis at the 5 percent level; F-ratio = 1.561. The explained 79.09 percent differential in favour of the Chinese can be further decomposed into the amount attributable to differences in endowments and the amount attributable to differences in their wage determining mechanism. Just over 46 percent of the explained differential can be attributed to the inferior endowments of the Malays in the sample, leaving about 54 percent of the explained differential attributable to the superior coefficients in the wage structure of the Chinese.

By far the largest part of the explained differential is accounted for by differences in educational endowments and returns to education; these in fact reinforce each other. Three other factors which place the Chinese at a distinct advantage and which are almost entirely attributable to their superior coefficients are their returns to employment in the tertiary and secondary sectors of the economy, and their returns to employment in foreign firms. These are not completely unexpected since the Chinese predominate in the modern tertiary and secondary sectors of the economy.

On the whole, the decomposition of the salary differential shows that just over 47 percent of the raw differential in favour of the Chinese can be attributed to the premium as defined above by the sum of the differential attributable to coefficients and the unexplained shift differential.

Table 1

Structural Analysis of Malay-Chinese Male
Salary Differential
Private Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	31.44	18.34	13.10
Quality of Education	0.13	4.73	-4.60
Experience	1.66	7.15	-5.49
Formal Training	1.62	-0.08	1.70
Union Membership	4.19	6.85	-2.66
Foreign Firm	7.05	0.51	6.54
Firm Size	1.85	-0.60	2.45
Tertiary Sector Employment	13.51	0.09	13.42
Secondary Sector Employment	7.10	0.09	7.01
Job Quits	1.48	-0.77	2.25
Motivation	5.17	-0.08	5.25
Family Background	3.89	0.44	3.47
Subtotal	79.09	E = 36.65	C = 42.44
Shift Differential U	-9.50		
Total R	69.59		P = C + U = 32.94

Note: A positive value indicates advantage for Chinese males and a negative value indicates advantage for Malay males. Components may not add to total due to rounding.

Table 2 presents the decomposition of the overall 82.09 percent salary differential in favour of the Chinese employees over their Indian counterparts in the private sector sample in the manner implied by the structural estimates. The independent variables account for a 100.25 percent advantage in favour of Chinese males, leaving a 17.60 percent advantage in favour of the Indian males to the unexplained shift coefficient. As in the MC male analysis just over 44 percent of the differential explained by the 'objective' characteristics variables are attributable to the superior endowments of the Chinese, and about 56 percent can be attributed to the superior coefficients in the wage structure of the Chinese.

Again, the largest part of the explained differential is accounted for by differences in the educational endowments of the two groups and in the returns to schooling; these also reinforce each other and confer a distinct advantage to the Chinese. Four other factors confer a distinct advantage to the Chinese, and these are mainly due to their superior coefficients, i.e. returns to employment in the tertiary and secondary sectors of the economy and their superior returns to 'motivation' and family background. On the other hand, two factors seem to favour the Indians - experience and establishment size, and these are attributable mainly to their superior coefficients in the earnings function.

Taking the explained and unexplained differentials into account, the raw differential in terms of the structural estimates amounts to 82.65 percent, and just over 46 percent of this differential can be attributed to a premium in favour of the Chinese. Again, it should be noted that the test of the equality of the two sets of coefficients led to a rejection of the null hypothesis at the 1 percent level; F-ratio = 2.492.

Structural analysis of IM male salary differential is shown in Table 3. The structural estimates imply a small 12.47 percent differential in favour of Malay male employees. As can be seen, just over 48 percent of the explained differential is attributable to the superior endowments of the Malays, and 52 percent to their superior wage structure. Here, as in the previous cases, the largest portion of the explained differential is attributable to differences in educational endowments. Two other factors which confer an advantage to the Malays and which are almost wholly attributable to their superior coefficients are the returns to 'motivation'

Table 2

Structural Analysis of Indian-Chinese Male
Salary Differential
Private Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	51.41	30.69	20.72
Quality of Education	-3.90	0.95	-4.85
Experience	-11.74	-1.24	-10.50
Formal Training	2.04	1.07	0.97
Union Membership	9.14	10.11	-0.97
Foreign Firm	2.43	-2.13	4.56
Firm Size	-13.18	-0.15	-13.03
Tertiary Sector Employment	15.05	4.61	10.44
Secondary Sector Employment	13.33	-0.71	14.04
Job Quits	3.90	-0.28	4.18
Motivation	15.73	-2.11	17.84
Family Background	16.04	3.49	12.55
Subtotal	100.25	E = 44.30	C = 55.95
Shift Differential U	-17.60		
Total R	82.65		P = C + U = 38.35

Note: A positive value indicates advantage for Chinese males and a negative value indicates advantage for Indian males. Components may not add to total due to rounding.

Table 3

Structural Analysis of Indian-Malay Male
Salary Differential
Private Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	19.98	13.82	6.16
Quality of Education	-4.03	-1.47	-2.56
Experience	-13.40	-8.53	-4.87
Formal Training	0.42	0.47	-0.05
Union Membership	4.94	2.79	2.15
Foreign Firm	-4.60	-1.06	-3.54
Firm Size	-15.02	0.09	-15.11
Tertiary Sector Employment	1.53	-1.46	2.99
Secondary Sector Employment	6.23	2.04	4.19
Job Quits	10.57	-0.63	11.20
Family Background	11.58	2.83	8.75
Subtotal	20.62	E = 9.95	C = 10.67
Shift Differential U	-8.10		
Total R	12.52		P = C + U = 2.57

Note: A positive value indicates advantage for Malay males and a negative value indicates advantage for Indian males. Components may not add to total due to rounding.

and family background. On the other hand, Indian male employees have a distinct advantage in terms of experience, though this is mainly due to their superior endowments and establishment size, and the latter is attributable mainly to their superior coefficient.

The portion of the raw differential which is attributable to the premium amounts to only 20 percent in this case compared with over 45 percent in the MC and IC cases. This is perhaps not surprising since the test of equality between the two sets of coefficients led to an acceptance of the null hypothesis; F-ratio = 0.953.

Structural form earnings functions are also estimated for female employees in the private sector sample except for Indian female employees for whom there are only 26 observations. The final structural form earnings functions for Chinese and Malay women are given in Appendix II.

The unadjusted female Malay-Chinese (MC) salary ratio is 0.953. On the basis of the estimated earnings functions the endowments adjusted salary ratio is 1.022, implying that if Malay women have the earnings characteristics of their Chinese counterparts they would in fact earn more than the latter. Standardization for differences in their earnings structures gives a coefficients adjusted salary ratio of 0.998 which implies that if Malay women have the same earnings function as their Chinese counterparts they would earn almost as much as the latter.

Clearly, most of the differential can be attributed to differences in endowments; see Table 4. In order to determine the extent to which differences in endowments and coefficients affect the salary differential, and to determine the extent of wage discrimination, if any, among females in the private sector sample the raw differential implied by the structural equations are decomposed into the different portions as shown in Table 4.

By far the largest portion of the explained differential is accounted for by differences in the returns to education. This, together with the superior educational endowments of the Chinese female employees, confer upon them a distinct advantage over the Malay female employees. The only other factor of considerable advantage to the Chinese is the returns to their family background. On the other hand, Malay female employees experience considerable advantage in terms of the returns to their employment in the secondary and tertiary sectors of the economy, and to the quality of their schooling.

Table 4

Structural Analysis of Malay-Chinese Female
Salary Differential
Private Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	54.89	7.26	47.63
Quality of Education	-10.38	1.07	-12.05
Experience	3.82	3.47	0.35
Formal Training	-0.37	-0.25	-0.12
Union Membership	-1.14	0.98	-2.12
Foreign Firm	6.35	-0.18	6.55
Firm Size	-2.04	-0.90	-1.14
Tertiary Sector Employment	-16.61	4.68	-21.29
Secondary Sector Employment	-26.15	-3.26	-22.89
Job Quits	0.37	-0.43	0.80
Motivation	-1.21	-1.42	0.21
Family Background	13.57	-0.96	14.53
Subtotal	20.52	E = 10.06	C = 10.46
Shift Differential U	-8.20		
Total R	12.32		P = C + U = 2.26

Note: A positive value indicates advantage for Chinese females and a negative value indicates advantage for Malay females. Components may not add to total due to rounding.

On the whole, 49 percent of the explained differential can be attributable to the superior endowments of the Chinese, and 51 percent to their superior earnings function. The explained differential confers a distinct advantage amounting to 20.52 percent to the Chinese female employees, leaving a 8.20 percent advantage to the Malay female employees in terms of the unexplained shift coefficient. The raw differential reduces to 12.32 percent as implied by the structural equations, but of this differential only 18 percent is attributable to the premium. This small figure is perhaps not surprising since the two sets of coefficients do not differ significantly; F-ratio = 0.777.

III Public Sector Inter-racial Wage Differentials

Ethnic earnings functions by sex groups are also estimated for all groups in the public sector sample except for Indian female employees for whom there are only 41 cases. The final structural form of the earnings function is similar to that in the case of the private sector. Here four variables which are not applicable have been excluded from the final structural form. These are union membership (UNION), ownership (FORFIRM), establishment size (FIRMSIZE), and sector of employment (TERSECT and SECSECT) - all employment variables (see pp. 46-47 of this chapter). The regression coefficients upon which the analysis is based are provided in Appendix III.

Unlike the private sector case the analysis here is in terms of monthly earnings.[5] The preference for earnings lies in the fact that some employees, especially those in professional occupations, are paid regular incentive allowances which may form a substantial proportion of their total earnings. To exclude these allowances would be to underestimate the actual returns to education, experience, and the other determinants of earnings.

The average monthly earnings of Malay male employees in the public sector sample is $860.53 compared with the corresponding monthly averages of $1145.84 and $975.46 for their Chinese and Indian counterparts, respectively. Again, these averages are high due to the bias in the sample in favour of those with higher educational qualifications. Here, the unadjusted male Malay-Chinese (MC), Indian-Chinese (IC), and Malay-Indian (MI) earnings ratios are 0.709, 0.818, and 0.867, respectively.[6]

Taking into account differences in endowments and wage structures, the endowment adjusted male MC, IC, and MI earnings ratios are 0.940, 0.938, and 1.077, respectively. The coefficients adjusted ratios are 0.735, 0.868, and 0.783, respectively. These imply that earnings differentials between the three ethnic groups are due essentially to differences in their endowments or earnings characteristics rather than to differences in their wage structures or earnings determining processes. In fact, if the Malays are given the endowments of their Indian counterparts they would earn more than the Indians. On the other hand, if they posses the earnings determining process of their Indian counterparts they would earn less than if they retain their own earnings structures.

The structural analyses of inter-racial earnings differentials show this to be the case, and also show that in almost all cases the major portion of the explained differential is due to differences in schooling and the returns to schooling. Tables 5, 6, and 7 show the structural analyses of MC, IC, and MI earnings differentials for male employees in the public sector sample. In the first case (MC), differences in educational endowments and the returns to schooling confer a distinct advantage upon the Chinese. But, as the analysis shows, only 11 percent of the raw differential can be attributed to the premium. This is expected since the two sets of coefficients do not differ significantly; F-ratio = 1.376. A somewhat similar situation exists in the analysis of IC earnings differential. Here, Indians actually enjoy an advantage in terms of the returns to schooling and the quality of schooling. In fact, the explained differential is in favour of the Indians, and this is due to their superior earnings structure. However, the large unexplained differential in favour of the Chinese reduces the overall raw differential to 16.42 percent. But the main point here, as in the previous case, is that only about 11 percent of the raw differential is attributable to the premium. Again, the two sets of coefficients do not differ significantly; F-ratio = 1.473. In the analysis of MI earnings differential, differences in educational endowments, and more so in the returns to schooling, account for most of the explained differential which favour the Indians. However, the large unexplained differential in favour of the Malays reduces the overall raw differential to 14 percent. The main difference here, from the two previous cases, lies in the fact

Table 5

Structural Analysis of Malay-Chinese Male
Earnings Differential
Public Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	45.66	25.32	20.34
Quality of Education	4.88	-1.30	6.18
Experience	3.29	3.58	-0.29
Formal Training	-1.96	1.43	-3.39
Job Quits	0.47	0.09	0.38
Motivation	-2.14	1.54	-3.68
Family Background	-3.67	-0.21	-3.46
Subtotal	46.53	E = 30.45	C = 16.08
Shift Differential U	-12.20		
Total R	34.33		P = C + U = 3.88

Note: A positive value indicates advantage for Chinese males and a negative value advantage for Malay males.
Components may not add to total due to rounding.

Table 6

Structural Analysis of Indian-Chinese Male Earnings Differential
Public Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	-15.54	16.94	-32.48
Quality of Education	-23.52	1.35	-24.87
Experience	-9.10	-3.34	-5.76
Formal Training	-4.81	1.26	-6.07
Job Quits	1.17	0.03	0.87
Motivation	8.46	0.50	7.96
Family Background	-13.67	-2.07	-11.60
Subtotal	-57.28	E = 14.67	C = -71.95
Shift Differential U	73.70		
Total R	16.42	P = C + U =	1.75

Note: A positive value indicates advantage for Chinese males and a negative value advantage for Indian males.
Components may not add to total due to rounding.

Table 7

Structural Analysis of Malay-Indian Male
Earnings Differential
Public Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	61.20	9.67	51.53
Quality of Education	27.01	11.23	15.78
Experience	12.39	7.96	4.43
Formal Training	2.98	0.07	2.91
Job Quits	0.66	0.11	0.55
Motivation	-10.60	0.51	-11.11
Family Background	6.57	-2.27	8.84
Subtotal	100.21	E = 27.28	C = 72.93
Shift Differential U	-85.90		
Total R	14.31		P = C + U = -12.97

Note: A positive value indicates advantage for Indian males and a negative value indicates advantage for Malay males. Components may not add to total due to rounding.

that the premium is in favour of the lower income group, and if it were not for their superior endowments the Indians would in fact earn less than their Malay counterparts. The two sets of coefficients differ significantly; F-ratio = 1.762 which is significant at the 5 percent level.

The regression estimates used in the analysis of earnings differentials between Malay and Chinese women in the public sector sample are given in Appendix III. Note that the two sets of coefficients are significantly different at the 5 percent level; F-ratio = 1.663. The average monthly earnings of the two groups of women, Malay and Chinese, are $764.86 and $1014.37, respectively. Again, these figures are higher than can be expected due to the bias in the sample in favour of the more educated. The unadjusted Malay-Chinese (MC) earnings ratio is 0.730, compared with the endowments adjusted ratio of 0.971, and the coefficients adjusted ratio of 0.726, which suggest that the bulk of their earnings differential lies in differences in their endowments rather than in their wage structures though the two do differ significantly.

The structural analysis of their earnings differential shown in Table 8 reveals the above to be the case. Here, as in the case of the male employees, the largest portion of the explained differential is attributable to differences in educational endowments and the returns to schooling. This is however reduced quite considerably by the superior returns to school quality enjoyed by Malay women in the public sector sample. Returns to experience favour the Chinese and add to their overall advantage of 35 percent. Nevertheless, only a small portion (less than 1 percent) of the raw differential is attributable to the premium.

IV Concluding Remarks

Perhaps the most important finding here lies in the contrast between the two sectors. In the private sector sample, between 20 to 47 percent of the raw differential in male inter-racial salary differentials, and about 18 percent of the raw differential in female inter-racial salary differential may be attributed to a premium. In contrast, in the public sector sample no more than 11 percent of male inter-racial earnings

Table 8

Structural Analysis of Malay-Chinese Female
Earnings Differential
Public Sector Sample

Causal Factor	Amount Attributable (%)	Amount Attributable to Endowments (%)	Amount Attributable to Coefficients (%)
Length of Education	49.53	24.17	25.36
Quality of Education	-30.54	1.89	-32.43
Experience	16.99	4.46	12.53
Formal Training	-0.31	0.60	-0.91
Job Quits	2.54	2.61	-0.07
Motivation	-9.25	0.44	-9.69
Family Background	-0.97	1.05	-2.02
Subtotal	27.99	E = 35.22	C = -7.23
Shift Differential U	7.40		
Total R	35.39		P = C + U = 0.17

Note: A positive value indicates advantage for Chinese females and a negative value for Malay females.
Components may not add up to total due to rounding.

differenials is attributable to the premium as defined by the sum of the differential attributable to coefficients and the unexplained shift coefficient. In fact, the portion of the raw differential in female earnings differentials which is attributable to this premium is less than 1 percent. It appears that while a substantial part of the raw differentials in the private sector sample may be attributed to the premium which reflects differing demand and supply conditions as well as differences in motivation and drive, the greater part of earnings differentials in the public sector sample arises out of differences in endowments. The latter is not surprising given the more rigid wage and employment structures in the public sector than in the private sector.

Where the two sectors are concerned, at least one-half of inter-racial differentials in salary and earnings can still be attributed to differences in endowments. The provision of more and better education to the disadvantaged - the Malays and Indians - should therefore help to reduce existing differentials in the longer run. However, if it is productive as it appears to be, and contributes significantly to personal income, and therefore to national income, then the provision of more and better education to the disadvantaged group(s) should not be made at the expense of the remaining group(s).

At this point, it must be acknowledged that this method of analysing wage differentials does not take into consideration differences in occupational access - a topic left for the following chapter (but see Brown, Moon, and Zoloth, 1980). Nevertheless, it does highlight the fact that a large proportion of wage differentials may be attributed to differences in educational endowments. However, particularly in the private sector which tends to operate on a more competitive basis, a substantial portion of wage differentials remains to be explained by differences in supply and demand conditions, motivation and drive which are inadequately covered here, rather than to discrimination as commonly referred to in Western literature on the matter. Of course some portion of wage differentials may be discriminatory practices, but even then these may not be discrimination <u>per se</u> as understood in the West. It is probable that Malays and Indians may find themselves placed at a disadvantage, not because of discrimination <u>per se</u> but because of such factors as language. Because they are not able to communicate in the

same language as the Chinese who dominate the urban private sector they may not gain easy access to such employment opportunities. Such factors may be highly important, and call for further investigation of employment and recruitment practices in Malaysia.

CHAPTER IV

DETERMINANTS OF OCCUPATIONAL MOBILITY

The New Economic Policy aims not only at an equalisation of earnings between the three principal ethnic groups but also an equalisation of occupational attainment which must entail an attempt to equalise opportunities for occupational access and occupational mobility. In Malaysia, it has been argued that the labour market is segmented along racial lines with the Chinese occupying a dominant position in the private sector (see Mehmet 1972). If non-competitive recruitment practices abound and various institutional rigidities are common, then the equalisation of educational opportunities may not have the desired impact. In particular it may not have a significant impact on the restructuring of Malaysian society in such a manner that the identification of race with economic function will be reduced and eventually eliminated. The problem here is to determine the role of education and the basic human capital variables in the determination of occupational attainment and occupational mobility, giving sufficient emphasis on inter-racial differences.[1]

I A Model of Occupational Mobility

Following the human capital framework, access to jobs is largely dependent on the stock of human capital. These are usually defined to include formal schooling and education as well as the stock of post-schooling investment. The two major sources of post-schooling investment are formal on-the-job training and firm specific work experience, as well as other work experience. Human capital investment may also take the form of investment in information as defined in search theory literature to include job turnovers and changes in the sector of employment. Apart from these factors, differences in personal characteristics, motivations, family background and employment characteristics may also affect the occupational status and mobility of the individual. With these in mind the following simple recursive framework of occupational attainment and mobility may be specified:

$$(1)\quad O_c = f(O_f, NS_c, NS_f, t_c, t_p, FOJT_c, FOJT_p, E, Q, P, M, B, N) + u_1$$

$$(2)\quad NS_c = g(NS_f, O_f, t_c, t_p, FOJT_c, FOJT_p, E, Q, P, M, B, N) + u_2$$

where O_c = current occupation

O_f = first occupation

NS_c = current employment sector

NS_f = first employment sector

t_c = firm specific work experience

t_p = previous work experience

$FOJT_c$ = formal on-the-job training provided by current employer

$FOJT_p$ = formal on-the-job training provided by previous employer(s)

E_i = vector of educational qualifications

Q = vector of school quality in terms of language, status, and location

P = vector of personal characteristics such as race and sex

M = vector of demographic or 'motivational' variables

B = vector of family background variables

N = vector of present employment characteristics

u_1, u_2 = disturbance terms.

The endogenous variables in the model are O_c and NS_c, and the remaining variables are treated as either exogenously determined - t_c, t_p, $FOJT_c$, E_i, Q, P, M, B, N - or as lagged endogenous variables - O_f and NS_f.[2]

To reflect the focus on occupational mobility a recursive structure is imposed on the model. Here, two assumptions are necessary. First, O_c must be assumed to have a zero coefficient in the equation determining NS_c. This implies that the choice of current employment sector influences the choice of current occupation but not vice versa. Secondly, to treat NS_c as a predetermined variable in equation (1) u_1 must be uncorrelated with u_2. Equation (1) may then be consistently estimated by OLS without further attention being devoted to equation (2).

The first assumption that the shift in sector of employment comes prior to shifts in occupational status is, to a large extent, arbitrary. However, recent discussions on internal labour markets by dual labour market theorists as well as non-dualists suggest that interfirm mobility- reflected by industry or regional mobility - does not guarantee simultaneous occupational mobility. It is argued that upward mobility comes through the accumulation of seniority (see Wachter 1974).

The second assumption concerning the error terms breaks down if the disturbances capture the effects of those variables that are difficult to measure directly (e.g. motivation and ability) which makes certain individuals more likely to advance up the occupational ladder than others. To the extent that $E(u_1, u_2) \neq 0$, OLS estimates of equation (1) will be biased and inconsistent.

One approach to solving the estimation problem is to obtain the reduced-form equation determining occupational mobility which may be written in simplified form as:

$$(3)\quad O_c = b_o + b_1 O_f + b_2 NS_f + b_3 t_c + b_4 t_p + b_5 FOJT_c + b_6 FOJT_p + b_7 E + b_8 Q + b_9 P + b_{10} M + b_{11} B + b_{12} N + e_1$$

Since the right-hand side variables are assumed to be predetermined, unbiased estimates of the reduced-form coefficients of equation (3) can be obtained by OLS. However, these do not yield estimates of the parameters of the structural equation for occupational mobility. Nevertheless this equation is an interesting empirical relationship which draws out racial differences in the effects on occupational mobility of formal education, formal on-the-job training, initial employment sector, length of work experience, and family background. Coefficient estimates are emphasized in testing for racial differences in the effects of human capital and structural variables.

Before turning to the empirical findings the role of O_f in equation (1) and (3) should be discussed. O_f serves to reflect the impact of the first full-time occupation in determining current occupation, O_c. This may be shown as follows by rewriting equation (3):

$$(4)\quad O = b_o + \lambda O_f + \sum_i b_i X_i + e_1$$

where $\Delta O = O_c - O_f$

$\lambda = b_1 - 1$

b_i = vector of coefficients

X_i = the set of explanatory variables other than O_f.

A negative correlation between occupational change and initial occupational status, i.e. $\lambda < 0$ in equation (4) is expected, at least in part, because λ captures the 'regression-towards-the-mean' phenomenon. This implies that an individual who starts off at the top of the occupational scale is, ceteris paribus, less likely to advance still further; instead he is more likely to suffer downgrading, if at all (Leigh 1978, p. 36). The opposite holds for those who start off at the bottom of the scale. λ has been interpreted in sociological literature as a measure of the 'openness' of the occupational structure. For instance, Bielby, Hauser, and Featherman (1974), using a model similar in structure to equation (3) interpret the size of the positive coefficient on O_f as representing the 'stability' of a worker's occupational status during his career. Hence $1 - b_1$ or λ may be taken to represent occupational instability or openness of the occupational hierarchy. Estimates of λ therefore provide useful information relating to occupational mobility in terms of mobility opportunities for the different races.

Finally, it must be restated that the occupational variable used here is based on the Treiman International Occupational Prestige Scale which is basically an ordinal scale (see Treiman 1977). This might be considered a major shortcoming but it has been argued that the proper assignment of numeric values to the categories of an ordered metric scale will allow it to be treated as though it were measured at the interval scale. As Labovitz argues, "Although some small error may accompany the treatment of ordinal variables as interval, this is offset by the use of more powerful, more sensitive, better developed, and more clearly interpretable statistics with known sampling error" (Labovitz 1970). Statistical purists may disagree but more and more data analysts are following this approach, especially when the research is exploratory or heuristic in nature (Nie, et. al. 1975, p. 6).

II Occupational Mobility in the Private Sector

In presenting the results, two variations of equation (3) are examined. The first reduce-form estimates of the impact of the explanatory variables occupational prestige are obtained by omitting O_f from the equation. These estimates can be interpreted as measuring the 'total' effect of the explanatory variables (without O_f) on occupational prestige attainment. This 'total' effect naturally consists of the indirect effect which works via the determination of the initial occupation, and a direct effect which works via the determination of occupational mobility between the initial occupation and the present occupation. The second version estimates the complete reduced-form equation (3), and estimates of the direct effect of the explanatory variables on occupational change ($\triangle C$) are obtained from equation (4).

The following variables are used:

I Education Variables

1. Educational Qualifications	E_1 = 1 if Lower Certificate of Education
	E_2 = 1 if Malaysian Certificate of Education
	E_3 = 1 if Post-schooling Qualification
	E_4 = 1 if Higher School Certificate
	E_5 = 1 if college or professional qualification
	E_6 = 1 if University degree
2. Language of Instruction	S_e = 1 if English medium
3. Status of School	S_g = 1 if government school
	S_a = 1 if government-aided
4. Location of School	S_c = 1 if in the city or municipality
	S_t = 1 if in state or district capital

II	Employment Characteristics		
	1. First Employment Sector	NS_f^p	= 1 if first employment was in the primary sector
		NS_f^s	= 1 if first employment was in the secondary sector
		NS_f^t	= 1 if first employment was in the tertiary sector
	2. Firm Specific Work Experience	t_c	= years of actual full-time work experience in the present firm
	3. Past Work Experience	t_p	= years of actual full-time work experience before joining the present firm
	4. Firm Specific Formal Training	$FOJT_c$	= 1 if respondent was given some form of formal training by the present firm
	5. Past Formal Training	$FOJT_p$	= 1 if respondent was given some form of formal training by past employer(s)
	6. Union Membership	UNION	= 1 if union member
	7. Job Quits	QUITS	= number of past employers
	8. Ownership	FORFIRM	= 1 if firm is foreign owned or controlled
III	Personal Characteristics		
	1. Sex	MALE	= 1 if respondent is of the male sex
IV	Demographic or Motivational Characteristics		
	1. Marital Status	MARRIED	= 1 if respondent is married
	2. Number of Dependents	NODEP	= number of people who are financially dependent upon the individual
V	Family Background		
	1. Mother's Education	MED	= number of years of education of the respondent's mother
	2. Mother's Occupation	MOC	= occupational prestige score
	3. Father's Education	FED	= number of years of education
	4. Father's Occupation	FOC	= occupational prestige score
	5. Sibling Position	FLBCHILD	= 1 if respondent is a first or last born child

6.	Family Size	FAMSIZE = number of children in the family
7.	Childhood Environment	CE_1 = 1 if city or municipality
		CE_2 = 1 if state or district capital

Table 1 shows the reduced-form estimates when O_f is excluded. The estimates are interpreted as meaning the 'total' effect of the explanatory variables on occupational prestige. The coefficients of the educational qualifications variables shown for the three ethnic groups - Malays, Chinese and Indians (including 'Others') - are of the expected sign and relative magnitudes. Almost all the coefficients are significant, with the exception of the coefficient for the Lower Certificate of Education (E_1) among the Indians, at the 5 percent level or better. Tests of the hypothesis of no significant difference between the races in the effect of education resulted in the rejection of the null hypothesis in the Malay-Chinese (F-ratio = 3.160) and Indian-Chinese (F-ratio = 1.998) cases, but not in the Malay-Indian (F-ratio = 0.935) case. A comparison of the coefficients produces some interesting and important differences which are relevant to public policy in the restructuring of Malaysian society.

The structure of returns to the Chinese appears somewhat compressed relative to those of Malays and Indians in that across educational qualifications the estimated coefficients of the former are generally smaller than the corresponding estimates for the Malays and Indians. However, the sizeable differences in estimated intercepts place the Chinese (25.651 points) at an advantage over the Malays (22.562 points), and the Chinese and Malays over the Indians (20.158).

These racial differences in the 'total' impact of education on occupational prestige attainment may be illustrated more clearly by considering the detailed marginal impacts of successive levels of educational qualifications. These are displayed as step functions in Figure 1. By virtue of their much higher estimated intercept the Chinese stand in clear advantage over the Malays and Indians at all levels up to the Higher School Certificate level; beyond this the Chinese stand between the Malays and the Indians. Malays generally come in between the Chinese and the Indians at all levels up to the HSC. At the college/professional qualifications level their marginal returns (11.7 points)

Table 1

Reduced-Form Estimates without O_f:
Private Sector Sample

Regression Number	1	2	3
Race	Malay	Chinese	Indian
Constant	22.562	25.651	20.158
E_1	4.412[a] (3.262)	3.029[b] (2.299)	2.118 (1.000)
E_2	12.351[a] (8.772)	9.539[a] (8.910)	9.369[a] (4.612)
E_3	12.002[a] (7.532)	13.453[a] (11.528)	10.477[a] (4.041)
E_4	17.241[a] (8.939)	13.547[a] (10.839)	11.932[a] (3.801)
E_5	28.953[a] (16.055)	21.074[a] (15.246)	21.677[a] (5.177)
E_6	33.577[a] (19.184)	28.652[a] (23.652)	31.277[a] (11.168)
S_e	3.017 (2.860)	-0.379 (0.322)	4.303[c] (1.753)
S_g	-1.671 (1.491)	-1.045 (1.228)	2.293 (1.322)
S_a	1.305 (0.953)	0.637 (0.525)	0.065 (0.026)
S_t	0.507 (0.406)	2.883[b] (2.421)	0.566 (0.251)
NS_f^s	0.342 (0.223)	0.461 (0.306)	-1.089 (0.479)
NS_f^t	-1.507 (0.955)	2.598[c] (1.730)	-0.910 (0.384)
t_c	0.782[b] (2.838)	1.211[a] (6.015)	0.232 (0.633)
t_c^2	-0.023 (1.553)	-0.051[a] (4.514)	-0.019 (1.259)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
t_p	1.325[a] (2.805)	-0.164 (0.543)	-0.306 (0.560)
t_p^2	-0.087[b] (2.357)	0.043[c] (1.931)	0.024 (0.762)
$FOJT_c$	2.354[a] (2.947)	1.099[c] (1.804)	1.743 (1.419)
$FOJT_p$	-0.070 (0.060)	0.135 (0.182)	2.544 (1.258)
MALE	-2.645[a] (3.179)	-0.039 (0.058)	1.385 (0.823)
MARRIED	0.535 (0.566)	2.177[a] (3.039)	1.580 (0.948)
NODEP	0.187 (1.118)	0.217 (1.281)	0.198 (0.720)
MED	-0.186 (1.512)	0.041 (0.437)	0.045 (0.226)
MOC	0.031 (0.379)	0.055 (0.841)	-0.006 (0.054)
FED	0.103 (0.897)	-0.028 (0.335)	-0.084 (0.425)
FOC	0.013 (0.411)	0.030 (1.336)	0.045 (0.970)
FLBCHILD	-0.843 (1.064)	-0.004 (0.007)	0.113 (0.079)
FAMSIZE	0.110 (0.821)	-0.058 (0.496)	-0.020 (0.082)
CE_1	-0.744 (0.630)	-0.769 (0.743)	-0.889 (0.441)
CE_2	0.904 (0.887)	-1.304 (1.315)	0.060 (0.034)
UNION	-0.357 (0.391)	-4.406[a] (6.713)	-0.225 (0.152)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
QUITS	-1.138[b] (2.294)	-0.054 (0.187)	-0.252 (0.283)
FORFIRM	0.312 (0.410)	0.346 (0.560)	1.875 (1.548)
$\bar{R}^2$	0.761	0.743	0.720
F	42.102	51.729	13.616
Number of Cases	426	581	163

Figures in parentheses are t-ratios.

a: significant at 0.01 level

exceed those of the Chinese (7.5 points) and the Indians (9.7 points) taking them well above the non-Malays at the tertiary level. Though the Indians experience rather high marginal returns at the college/professional and university levels (in excess of the marginal returns to the Chinese) they are still placed at a clear disadvantage in terms of occupational prestige due mainly to their much lower estimated intercept.

The advantage which Malays experience at the tertiary level could be a clear reflection of the impact of the government's policies on the employment of Malays at management and professional levels in the job hierarchy. Given the regulations, though not strictly enforced, calling for proportionate representation at management levels and the very small proportion of Malays (1 percent) with tertiary education it is not surprising to find that the total impact of tertiary education on occupational prestige is high among the Malays.

To consider ethnic differences in the impact of educational qualifications on occupational mobility and the 'openness' of the occupational structures equation (3) is estimated for each ethnic group. The estimated coefficients are given in Table 2. Again, the Chow-test of equality between the sets of coefficients led to a rejection of the null hypothesis concerning the equality of the sets of coefficients in the case of Malay-Chinese functions (F-ratio = 3.136) and in the Indian-

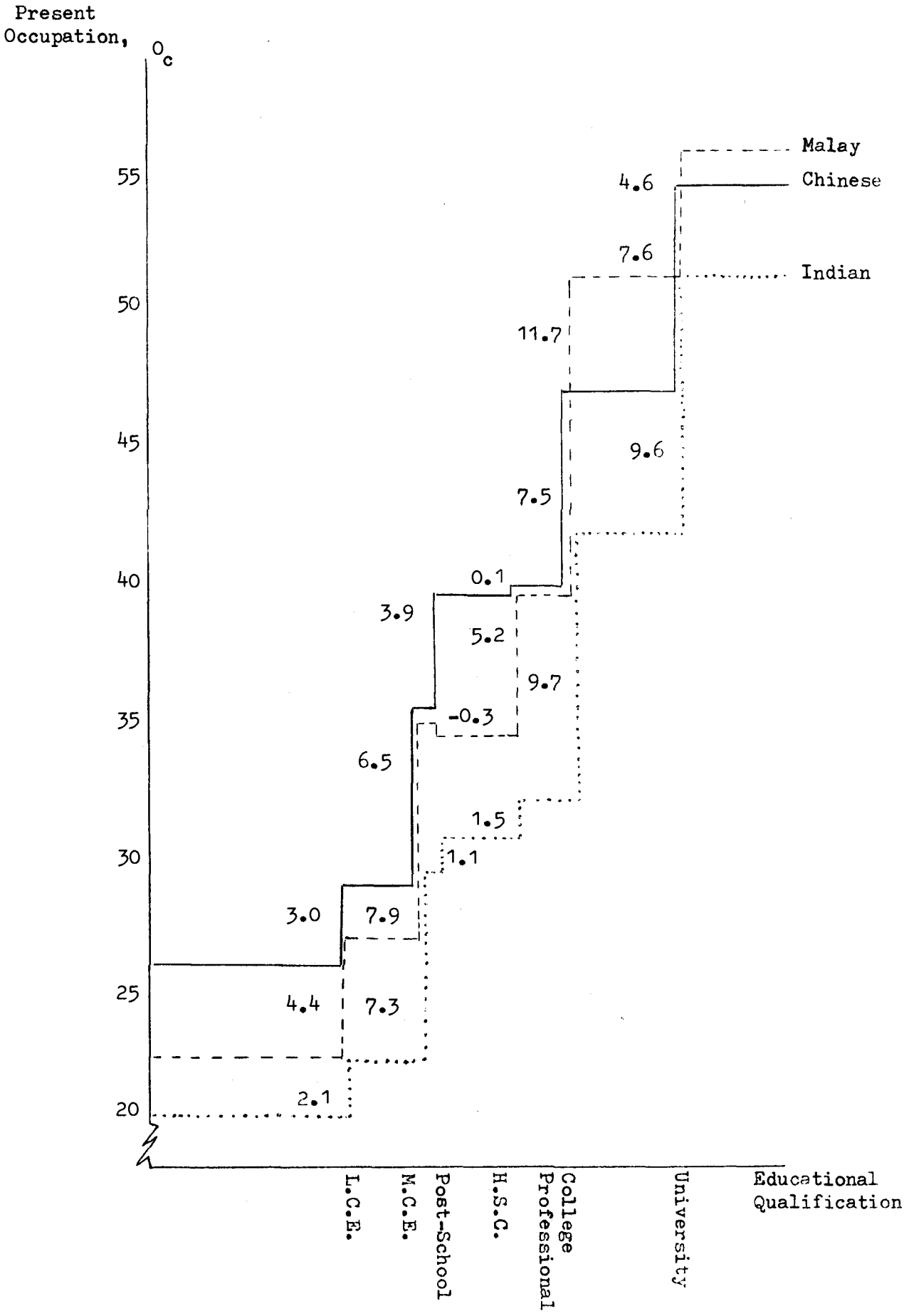

Figure 1: Incremental Changes in Current Occupational

Table 2

Reduced-Form Estimates with O_f:
Private Sector Sample

Regression Number	1	2	3
Race	Malay	Chinese	Indian
Constant	11.387	18.552	12.943
O_f	0.519[a] (11.811)	0.289[a] (7.192)	0.430[a] (5.516)
E_1	3.351[a] (2.874)	2.717[a] (2.155)	0.752 (0.390)
E_2	7.335[a] (5.718)	6.706[a] (6.111)	4.561[b] (2.247)
E_3	7.876[a] (5.571)	10.493[a] (8.819)	6.122[b] (2.479)
E_4	11.355[a] (6.559)	10.040[a] (7.776)	4.361 (1.386)
E_5	17.142[a] (9.292)	16.623[a] (11.386)	15.387[a] (3.899)
E_6	19.432[a] (10.105)	21.567[a] (13.862)	19.077[a] (5.680)
S_e	1.598[c] (1.747)	-0.847 (0.749)	4.800[b] (2.165)
S_g	-1.190 (1.234)	-0.878 (1.079)	0.674 (0.424)
S_a	0.214 (0.162)	-0.998 (1.213)	0.902 (0.555)
S_c	0.792 (0.672)	1.031 (0.888)	0.993 (0.443)
S^t	-0.249 (0.232)	2.979[a] (2.614)	0.038 (0.019)
NS_f^s	-1.120 (0.846)	0.175 (0.121)	-1.326 (0.646)
NS_f^t	-2.813[b] (2.067)	2.195 (1.527)	-0.897 (0.419)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
t_c	0.619[a] (2.608)	1.261[a] (6.545)	0.143 (0.431)
t_c^2	-0.014 (1.111)	-0.051[a] (4.776)	-0.013 (0.989)
t_p	1.113[a] (2.739)	-0.003 (0.011)	-0.259 (0.528)
t_p^2	-0.065[b] (2.028)	0.039[c] (1.832)	0.023 (0.799)
$FOJT_c$	1.136 (1.636)	1.054[c] (1.809)	1.915[c] (1.727)
$FOJT_p$	-0.447 (0.442)	0.097 (0.136)	0.523 (0.281)
MALE	-1.353[c] (1.870)	0.309 (0.477)	2.291 (1.500)
MARRIED	0.841 (1.035)	1.580[b] (2.289)	1.661 (1.105)
NODEP	0.083 (0.574)	0.197 (1.217)	0.290 (1.165)
MED	-0.150 (1.418)	0.060 (0.662)	-0.020 (0.112)
MOC	0.024 (0.348)	0.023 (0.364)	-0.107 (0.980)
FED	0.049 (0.501)	-0.065 (0.817)	-0.039 (0.222)
FOC	-0.019 (0.700)	0.028 (1.267)	0.022 (0.515)
FLBCHILD	-0.964 (1.415)	-0.040 (0.066)	-0.693 (0.535)
FAMSIZE	0.193[c] (1.678)	-0.050 (0.445)	0.136 (0.596)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
CE_1	-0.538 (0.529)	-0.867 (0.876)	-2.500 (1.356)
CE_2	0.999 (1.139)	-1.314 (1.384)	0.286 (0.178)
UNION	-0.408 (0.518)	-4.104[a] (6.522)	0.765 (0.566)
QUITS	-0.673 (1.572)	-0.138 (0.498)	0.014 (0.017)
FORFIRM	-0.154 (0.235)	0.099 (0.167)	1.593 (1.455)
$\bar{R}^2$	0.824	0.765	0.772
F	59.403	56.385	17.125
Number of Cases	426	581	163

Figures in parentheses are t-ratios

a: significant at 0.01 level
b: significant at 0.05 level
c: significant at 0.10 level

Chinese case (F-ratio = 2.040) but not in the Malay-Indian case (F-ratio = 0.978).

Consider first the 'openness' of the occupational structures. The negative estimates of λ (= b_1 - 1) indicates that occupational change has the expected inverse relationship with initial occupational level, as given in equation (4). The more closely λ is to zero the more perfectly O_c is predicted by O_f for given values of the predetermined variables. The somewhat large negative value of λ (-0.711) for the Chinese suggests that, ceteris paribus, the occupational structure is more open for them than for the Malays (-0.481) and the Indians (-0.570). Clearly the 'openness' of the occupational structure with respect to upward occupational mobility is least for the Malays.

To bring out clearly the racial differences in the impact of educational qualifications on occupational mobility the detailed marginal effects of successive levels of educational qualifications are drawn as

step functions in Figure 2. Here, only steps which are significant at the 10 percent level or better are shown. The Chinese clearly stand out above the Malays and Indians. The higher estimated intercept of the Chinese (18.552 points) places them at an advantage over the Malays (11.387) and the Indians (12.943), and their generally higher marginal returns to educational qualifications, in terms of occupational mobility, at most levels raise the advantage across educational levels. Malays generally fare better than the Indians up to the Higher School Certificate level. The marginal returns to education, in terms of occupational mobility, are higher for the Malays up to the HSC level. At the tertiary level the marginal returns are higher for the Indians than for the Malays.

Turning now to school quality, the most interesting result is the significant and positive impact which an English medium education has on occupational prestige and occupational mobility for the Malays and Indians. In terms of the 'total' impact on occupational prestige the coefficients of S_e are significant at the 10 percent level or better for the non-Chinese but not for the Chinese (see Table 1). Having an English-medium education raises the occupational prestige of the Malay by 3 points and by 4 points for the Indian. In terms of occupational mobility an English-medium education raises the predicted current occupational prestige of the Malay by 2 points and that of the Indian by 5 points (see Table 2), assuming that all other things remain constant. These results are not completely unexpected since the lingua franca of the private sector is English and Chinese, so that the Chinese with English education have no advantage over their counterparts with Chinese-medium education. For the Malays and Indians an English education is a definite advantage.

The only other significant result in terms of school quality is the positive and significant coefficient for S_t for the Chinese. Having had an education in a state or district capital raises the predicted value of their present occupational prestige score by about 3 points (see Tables 1 and 2).

Several interesting and significant results also arise in the case of work experience and formal training. Firm specific work experience has a significant and positive impact on occupational prestige and occupational mobility for the Chinese (see Table 1 and 2) and Malays,

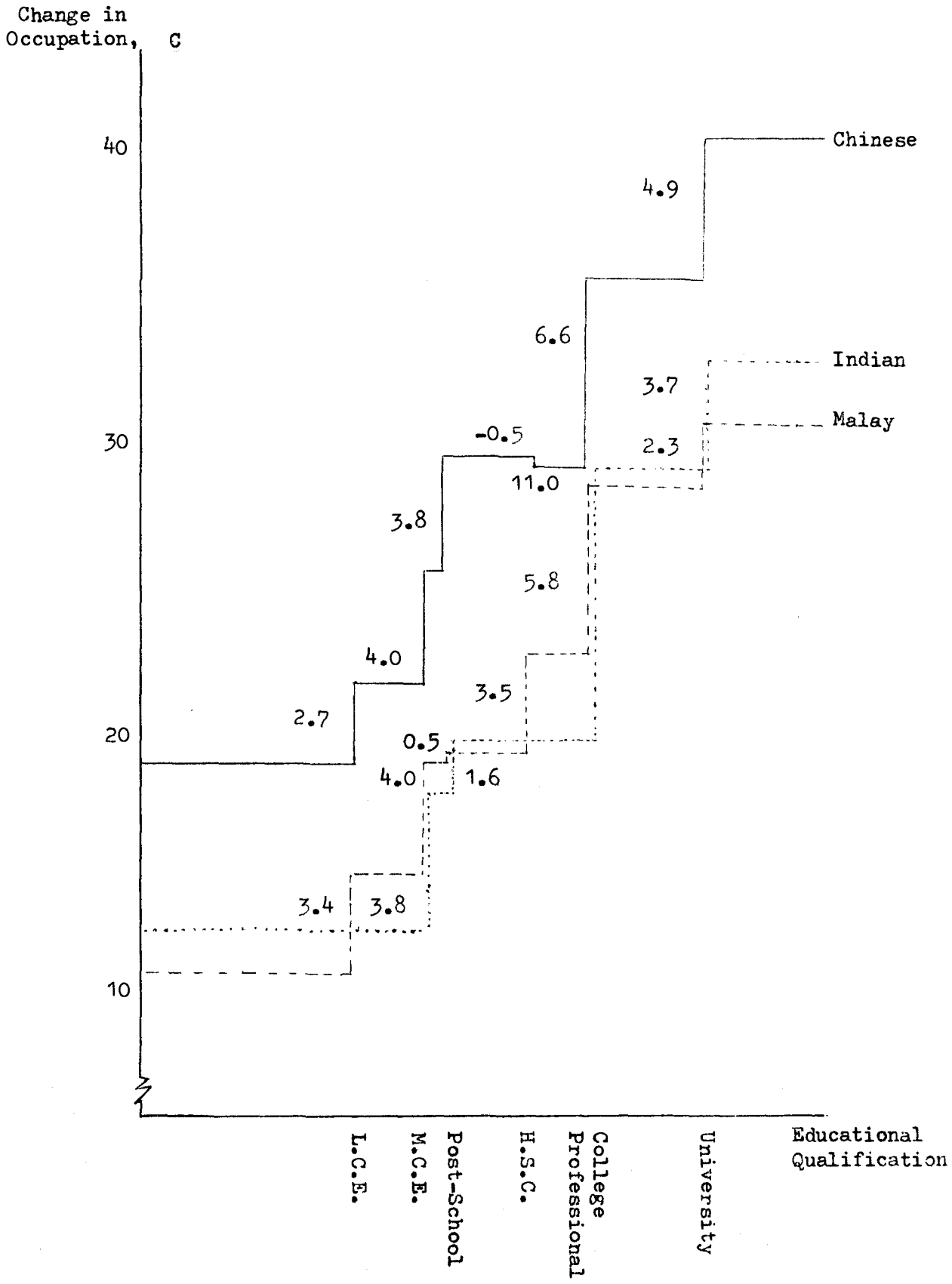

Figure 2: Marginal Impact of Education on Occupational Mobility: Private Sector

but not for the Indians. Past work experience also has significant impact for the Chinese and Malays, but not for the Indians. This is also the case with formal firm specific on-the-job training. The 'total' impact on occupational prestige score is roughly 2 points for the Chinese and 1 for the Malays; for the Indians the coefficient of $FOJT_c$ is insignificant. On the other hand, in terms of occupational mobility there is a positive and significant impact for the Chinese (1 point) and the Indians (2 points) but not for the Malays. Past formal on-the-job training has no significant impact in all three cases.

A somewhat surprising result is the negative and significant coefficient for the dummy variable 'male' among the Malays. Being a Malay male seems to have a negative 'total' impact on occupational prestige of about 3 points, and just over 1 point in terms of occupational mobility. This can perhaps be explained by the fact that Malay males tend to start off at the lower end of the occupational ladder than Malay females for given educational qualifications, especially those with primary and secondary schooling qualifications. They generally tend to start with blue collar jobs compared with Malay females who tend to start with white collar jobs, which probably offer more opportunities for upward occupational mobility (see Mazumdar 1975, p. 10).

In terms of the demographic or 'motivational' variables the only significant coefficient is that for the dummy variable 'married' for the Chinese in the complete reduced-form equation. Being married, for the Chinese, seems to raise the predicted value of their current occupational prestige score by 2 points.

Family background appears to have rather insignificant impacts on occupational prestige score and mobility. The only significant coefficient is that for family size for the Malays in the complete reduced-form equation (see Table 2). The positive and significant coefficient, at the 10 percent level, shows that family size does help, though only marginally, in terms of occupational mobility. This might be a reflection of the advantage of having a large extended family system among the Malays whereby a large number of brothers and sisters provides elements of nepotism and job search assistance which contributes towards one's upward occupational mobility.

In terms of the employment variables, union membership has a negative impact on occupational prestige score and occupational mobility among the Chinese. On the other hand the number of job quits has a negative and significant impact on occupational prestige among the Malays (see Table 1).

III Occupational Mobility in the Public Sector

A similar approach to that adopted for the private sector sample is used here. The two variations of equation (3) are examined. The first concentrates on the 'total' effect of education on occupational prestige attainment, and the second estimates the direct effect of education on occupational change ($\triangle C$).

Table 3 shows the reduced-form estimates for the public sector when O_f is excluded. As before, the estimates are interpreted as the 'total' effect of the explanatory variables on occupational prestige score. The coefficients for educational qualifications shown for the three ethnic groups are of the expected sign and relative magnitude and are significant in all cases, except for the coefficient for post-schooling qualifications among the Indians, at the 5 percent level or better. The Chow-test of equality between the sets of coefficients led to a rejection of the null hypothesis in the Malay-Chinese (F-ratio = 2.219) and Indian-Chinese (F-ratio = 1.582) cases at the 5 percent level or better, but not in the Malay-Indian case (F-ratio = 0.676), as in the private sector sample. At this point, it is important to note that the sample data exclude 'subordinate office workers' and unskilled workers in the 'Industrial and Manual Group' and senior personnel in the public services.[3] The results here are therefore applicable only to those occupations lying between these two bi-polar categories. The inclusion of these categories of employees can very well alter the results found here.

The sizeable intercepts found here (36.550 for the Malays, 40.319 for the Chinese, and 40.553 for the Indians) can be attributed to the exclusion of 'subordinate office workers' and unskilled workers in the 'Industrial and Manual Group' whose occupational prestige scores fall below 20 points, and to the fact that the omitted educational categories are the Lower Certificate of Education and below. The lower intercept for the Malays must be attributable to the fact that within

Table 3

Reduced-Form Estimates without O_f:
Public Sector Sample

Regression Number	1	2	3
Race	Malay	Chinese	Indian
Constant	36.550	40.319	40.553
E_2	5.104[a] (4.892)	7.715[a] (4.997)	6.388[b] (2.599)
E_3	5.481[a] (4.034)	6.925[a] (3.898)	3.255 (1.162)
E_4	8.326[a] (5.008)	13.161[a] (5.963)	11.906[a] (3.320)
E_5	19.536[a] (16.304)	17.725[a] (10.932)	17.488[a] (6.766)
E_6	26.290[a] (21.862)	25.408[a] (15.722)	27.474[a] (11.131)
S_e	1.980 (2.798)	-1.299 (0.808)	-1.750 (0.379)
S_g	1.581 (1.632)	0.573 (0.558)	0.651 (0.372)
S_a	0.984 (0.716)	1.406 (1.352)	1.980 (1.072)
S_c	1.584 (1.304)	-0.073 (0.051)	0.214 (0.095)
S_t	1.399 (1.296)	1.508 (1.026)	-1.879 (0.848)
NS_f^p	0.445 (0.194)	2.771 (0.611)	4.153 (0.796)
NS_f^s	-1.812 (1.093)	-1.393 (0.714)	3.183 (0.645)
NS_f^t	-1.113 (0.720)	-1.633 (1.022)	0.579 (0.139)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
t_c	-0.718[a] (3.478)	-0.283 (1.348)	-0.795[c] (1.757)
t_c^2	0.032[a] (3.039)	0.015 (1.216)	0.045[b] (2.007)
t_p	-0.294 (0.495)	-0.118 (0.154)	0.342 (1.268)
t_p^2	0.015 (0.300)	0.001 (0.019)	-1.819 (1.037)
$FOJT_c$	0.891 (1.265)	3.432[a] (5.311)	0.713 (0.519)
$FOJT_p$	0.978 (0.793)	1.311 (0.806)	1.473 (0.466)
MALE	0.228 (0.336)	0.931 (1.489)	1.546 (1.068)
MARRIED	0.848 (1.067)	-0.929 (1.286)	-0.941 (0.628)
NODEP	-0.045 (0.319)	-0.364[b] (2.072)	-0.319 (0.953)
MED	0.286[a] (2.724)	0.057 (0.625)	0.062 (0.348)
MOC	0.004 (0.046)	0.010 (0.177)	0.042 (0.291)
FED	0.026 (0.310)	0.050 (0.670)	-0.096 (0.569)
FOC	0.001 (0.047)	0.010 (0.415)	0.067 (1.240)
FLBCHILD	0.678 (0.982)	-0.043 (0.066)	1.961 (1.575)
FAMSIZE	-0.047 (0.410)	-0.045 (0.356)	-0.104 (0.489)
LE_1	-1.656[c] (1.694)	1.615[c] (1.774)	-2.682 (1.347)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
CE_2	-0.536 (0.705)	-0.669 (0.754)	-0.439 (0.230)
QUITS	0.602 (0.878)	0.162 (0.179)	-1.809 (0.771)
$\bar{R}^2$	0.766	0.782	0.786
F	44.027	29.742	15.004
Number of Cases	409	250	119

Figures in parentheses are t-ratios

a: significant at 0.01 level
b: significant at 0.05 level
c: significant at 0.10 level

the occupational categories covered they tend to predominate at the lower occupational levels such as in the protective services as policemen and firemen (occupational prestige scores between 35 to 40), and in the postal services as mail distribution clerks (occupational prestige score of 30).[4]

Although the structure of returns appears quite similar at the overall level there are significant differences across educational qualifications. These differences are shown as step functions in Figure 3; only those steps which are significant at the 10 percent level or better are drawn. By virtue of their lower estimated intercept and smaller 'total' effect at all levels below tertiary education the Malays appear to stand at a disadvantage vis-a-vis the Chinese and Indians. Between the Chinese and the Indians the differences at these levels of education are rather small.

At the college/professional level the marginal returns of the Malays (11.2 points) far exceeds those of the Chinese (4.6 points) and the Indians (5.6 points), taking them close to the Chinese and Indians at the college/professional level. However, at the University level the marginal returns are highest for the Indians (10.0 points) followed by the Chinese (7.7 points) and the Malays (6.8 points). The higher marginal return for the Indians may be due to their disproportionate share in such prestigious occupations as medical doctors (occupational prestige score of 78), professional accountants

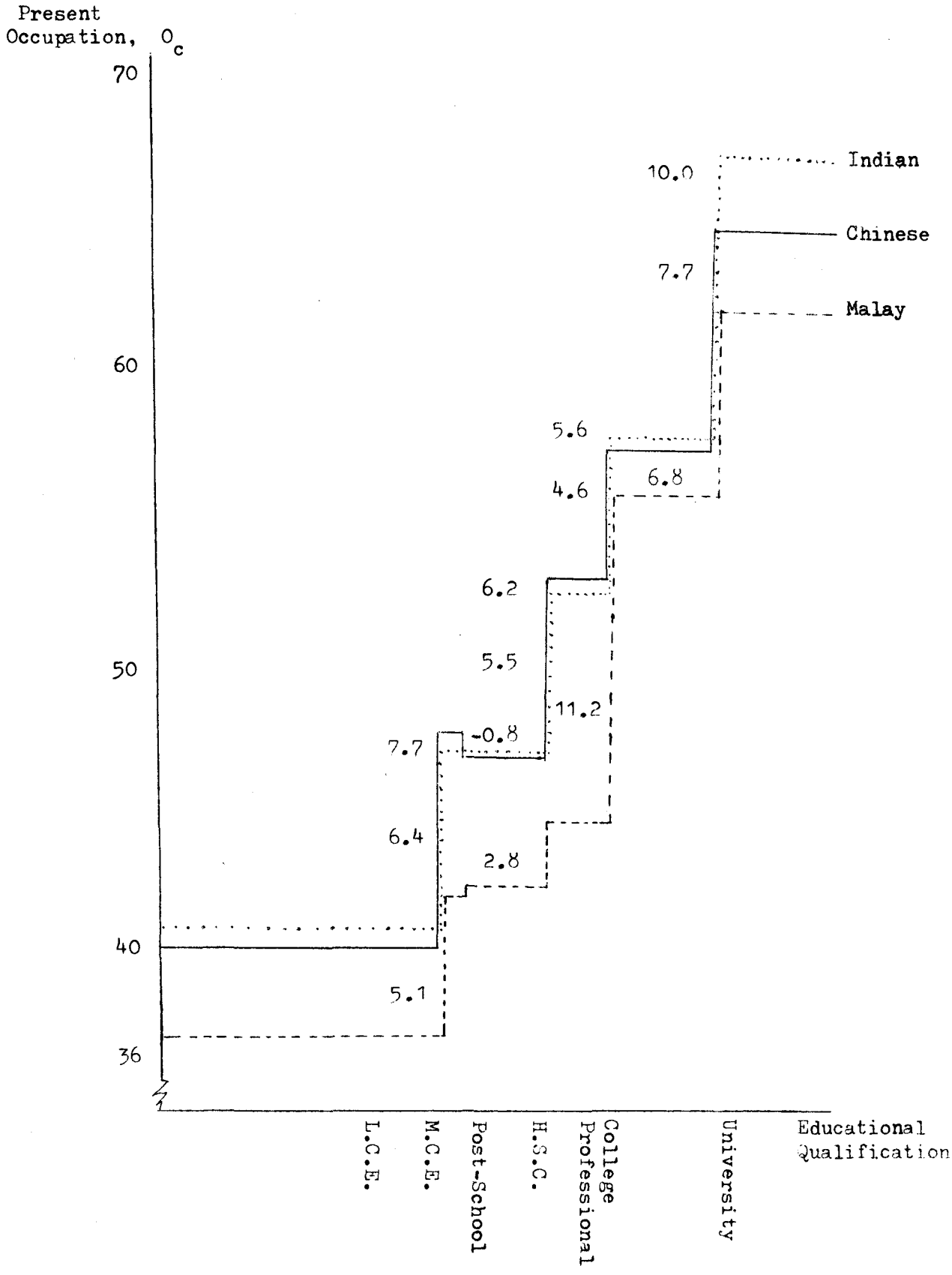

Figure 3: Incremental Changes in Current Occupational Attainment: Public Sector

(68), and architects and engineers (average score of 66). On the other hand, the lower standing among the Malays at the university level may be due to their disproportionate share in public service employment at the Division One administrative level (score of 64), and in the teaching profession (occupational prestige score ranging from 57 to 64).[5]

The impact of school quality and the language of instruction in school produce only one significant result, and this is the positive coefficient for the dummy variable S_e (English medium schooling) for the Malays. The coefficient is significant at the 1 percent level. Having an English-medium education raises the occupational prestige score of the Malay public employee by 2 points.

In the case of actual full-time work experience and formal training, public sector specific work experience has a significant and increasing impact on occupational prestige score for the Malays (the rate of change is $-0.718 + 0.064t_c$ which is positive after 11 years of public service) and the Indians (the rate of change is $-0.795 + 0.090t_c$ which is positive after about 9 years of public service), but not for the Chinese. Past work experience, i.e. experience in the private sector produces no significant results. On the other hand, formal training produces positive and significant result only for the Chinese; the 'total' effect is just over 3 points. Such differences between the three ethnic groups may arise from differences in the types of training received and in the jobs to which individuals are assigned after training, and might be worth an in-depth study.

Among the remaining variables only three produce any significant results. The number of dependents appears to have a negative 'total' effect on occupational prestige attainment among the Chinese. The coefficients are also negative for the Malays and Indians but they are not significant. Among the family background variables, mother's education has a positive and significant effect for the Malays, reflecting perhaps the importance of parental input in the case of the Malays. Childhood environment - being brought up in the city or municipality - confers a negative advantage to the Malays but a positive advantage for the Chinese.

To consider ethnic differences in the impact of educational qualifications on occupational mobility and the 'openness' of the occupational structures equation (3) is estimated for each ethnic group.

The estimated coefficients are given in Table 4. Again, note that subordinate office workers, unskilled workers in the 'Industrial and Manual Group', and senior Division One officers are not represented in the sample. The test of the equality of the three sets of coefficients led to a rejection of the null hypothesis only in the Malay-Chinese (F-ratio = 1.829) case but not in the Indian-Chinese (F-ratio = 1.417) and Indian-Malay (F-ratio = 9.635) cases.

Within the occupational groups covered, the somewhat large negative value of λ (-0.713) for the Chinese suggests that, ceteris paribus, the occupational structure is significantly more open for the Chinese then it is for the Malays (-0.574). The occupational structure appears to be least open for the Indians (λ = -0.476). This stands in contrast to the private sector sample case where the occupational structure is least open for the Malays. However, the estimates here include public sector employees with private sector experience who may have joined the public sector on the basis of being offered a better job than the one they first held in the private sector. This might account for the apparently large values which are comparable to those in the private sector sample. In order to examine the openness of the occupational structures within the public sector, regression estimates of equation (3) are estimated for the group of public sector employees with no private sector experience. As can be seen from Table 5, the values of λ are somewhat smaller for this group, as expected. The values of λ are -0.540 for the Malays, -0.314 for the Chinese, and -0.360 for the Indians. This implies that the occupational structure is least open for the Malays. The Chow-test of equality between the three sets of coefficients again led to a rejection of the null hypothesis in the Malay-Chinese (F-ratio = 2.307) and Indian-Chinese (F-ratio = 1.729) cases but not in the Malay-Indian case (F-ratio = 0.968).

Nevertheless, concentrating on the estimates in Table 5, racial differences in terms of the impact of educational qualifications on occupational mobility can be seen more clearly in Figure 4 where the marginal effects are drawn as step functions. Within the occupational categories covered in the sample, the Chinese stand well above the Malays and Indians. Their higher intercept value places them a clear 10 points ahead of the Malays who in turn stand 5 points ahead of the Indians. Generally, the Chinese experience higher marginal returns to

Table 4

Reduced-Form Estimates with O_f:
Public Sector Sample

Regression Number	1	2	3
Race	Malay	Chinese	Indian
Constant	19.768	30.077	15.636
O_f	0.426[a] (11.575)	0.287[a] (6.080)	0.524[a] (6.796)
E_2	2.463[a] (2.661)	6.647[a] (4.613)	4.443[b] (2.208)
E_3	2.347[c] (1.957)	6.493[a] (3.941)	2.286 (1.004)
E_4	5.185[a] (3.564)	10.570[a] (5.060)	7.012[b] (2.339)
E_5	11.524[a] (9.285)	13.916[a] (8.550)	7.946[a] (3.149)
F_6	16.028[a] (11.768)	19.526[a] (10.953)	12.918[a] (4.403)
S_e	1.239[b] (2.024)	-1.833 (1.229)	1.039 (0.276)
S_g	1.261 (1.513)	0.816 (0.857)	-0.096 (0.067)
S_a	0.096 (0.081)	1.540 (1.599)	0.278 (0.183)
S_c	1.636 (1.566)	-0.400 (0.302)	0.425 (0.233)
S_t	1.866[b] (2.009)	1.135 (0.833)	-0.123 (0.068)
NS_f^p	4.106[b] (2.043)	5.103 (1.209)	8.522[b] (1.992)
NS_f^s	3.548[b] (2.368)	1.148 (0.619)	-5.662 (1.407)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
NS_p^t	1.863 (1.377)	-0.248 (0.165)	3.781 (1.106)
t_c	-0.318[c] (1.759)	-0.196 (1.003)	-0.152 (0.402)
t_c^2	0.017[c] (1.815)	0.014 (1.307)	0.007 (0.366)
t_p	-0.489 (0.959)	0.304 (0.425)	-1.098 (0.769)
t_p^2	0.061 (1.375)	-0.008 (0.172)	0.283 (1.292)
$FOJT_c$	0.711 (1.173)	3.008[a] (4.991)	-0.318 (0.282)
$FOJT_p$	1.273 (1.199)	1.858 (1.231)	-2.423 (0.922)
MALE	0.708 (1.210)	0.653 (1.125)	1.295 (1.001)
MARRIED	0.614 (0.898)	-0.956 (1.430)	-0.125 (0.103)
NODEP	-0.066 (0.547)	-0.242 (1.479)	0.139 (0.498)
MED	0.274[b] (3.031)	0.032 (0.379)	0.114 (0.785)
MOC	0.0002 (0.002)	-0.031 (0.593)	0.042 (0.355)
FED	-0.036 (0.489)	0.039 (0.563)	-0.246[c] (1.773)
FOC	-0.013 (0.550)	0.001 (0.027)	0.066 (1.506)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
FLBCHILD	0.945 (1.591)	0.131 (0.215)	0.700 (0.682)
FAMSIZE	-0.009 (0.093)	-0.028 (0.242)	-0.128 (0.668)
CE_1	-1.112 (1.322)	1.058 (1.247)	-1.240 (0.761)
CE_2	-0.525 (0.803)	-0.970 (1.178)	0.284 (0.183)
QUITS	0.634 (1.076)	-0.017 (0.021)	-0.698 (0.365)
$\bar{R}^2$	0.827	0.813	0.859
F	61.881	34.721	23.529
Number of Cases	409	250	119

Figures in parentheses are t-ratios

a: significant at 0.01 level
b: significant at 0.05 level
c: significant at 0.10 level

Table 5

Reduced-Form Estimates with O_f:
Public Sector Employees without Private Sector Experience

Regression Number	1	2	3
Race	Malay	Chinese	Indian
Constant	10.499	20.744	10.023
O_f	0.686[a] (16.416)	0.460[a] (8.967)	0.640[a] (8.700)
E_2	2.403[b] (2.519)	6.109[a] (3.633)	6.084[a] (3.206)
E_3	1.834 (1.537)	6.947[a] (3.908)	3.877[c] (1.822)
E_4	3.605[a] (2.604)	8.836[a] (4.195)	6.057[c] (1.909)
E_5	5.356[a] (4.233)	10.691[a] (6.033)	6.593[a] (2.936)
E_6	9.214[a] (6.398)	14.467[a] (7.329)	9.753[a] (3.593)
S_e	1.822[a] (3.085)	-0.701 (0.527)	-0.966 (0.622)
S_g	1.214 (1.553)	-0.288 (0.335)	0.853 (0.642)
S_a	0.648 (0.611)	0.213 (0.245)	0.668 (0.475)
S_c	-1.429 (1.390)	0.014 (0.011)	-0.795 (0.460)
S_t	-1.400 (1.494)	0.837 (0.663)	-2.022 (1.175)
t_c	-0.009 (0.051)	-0.281 (1.568)	-0.094 (0.265)
t_c^2	0.002 (0.230)	0.019[c] (1.833)	0.001 (0.054)

cont'd

Regression Number	1	2	3
Race	Malay	Chinese	Indian
$FOJT_c$	1.327[b] (2.371)	3.724[a] (6.581)	1.068 (1.072)
MALE	0.038 (0.071)	0.019 (0.036)	-0.010 (0.010)
MARRIED	0.492 (0.772)	0.030 (0.048)	0.948 (0.787)
NODEP	0.056 (0.512)	-0.254[c] (1.758)	0.089 (0.345)
MED	0.136 (1.499)	0.061 (0.816)	-0.051 (0.393)
MOC	-0.0001 (0.002)	0.007 (0.157)	0.113 (1.026)
FED	-0.019 (0.281)	0.001 (0.020)	-0.131 (1.046)
FOC	-0.003 (0.119)	0.020 (1.009)	0.024 (0.571)
FLBCHILD	0.459 (0.814)	1.044[c] (1.909)	0.280 (0.320)
FAMSIZE	0.007 (0.068)	-0.019 (0.180)	-0.224 (1.321)
CE_1	0.020 (0.026)	-0.168 (0.217)	1.883 (1.250)
CE_2	-0.129 (0.200)	-0.842 (1.190)	4.223[c] (2.820)
$\bar{R}^2$	0.884	0.851	0.900
F	83.649	43.701	32.504
Number of Cases	295	203	95

Figures in parentheses are t-ratios

a: significant at 0.01 level
b: significant at 0.05 level
c: significant at 0.10 level

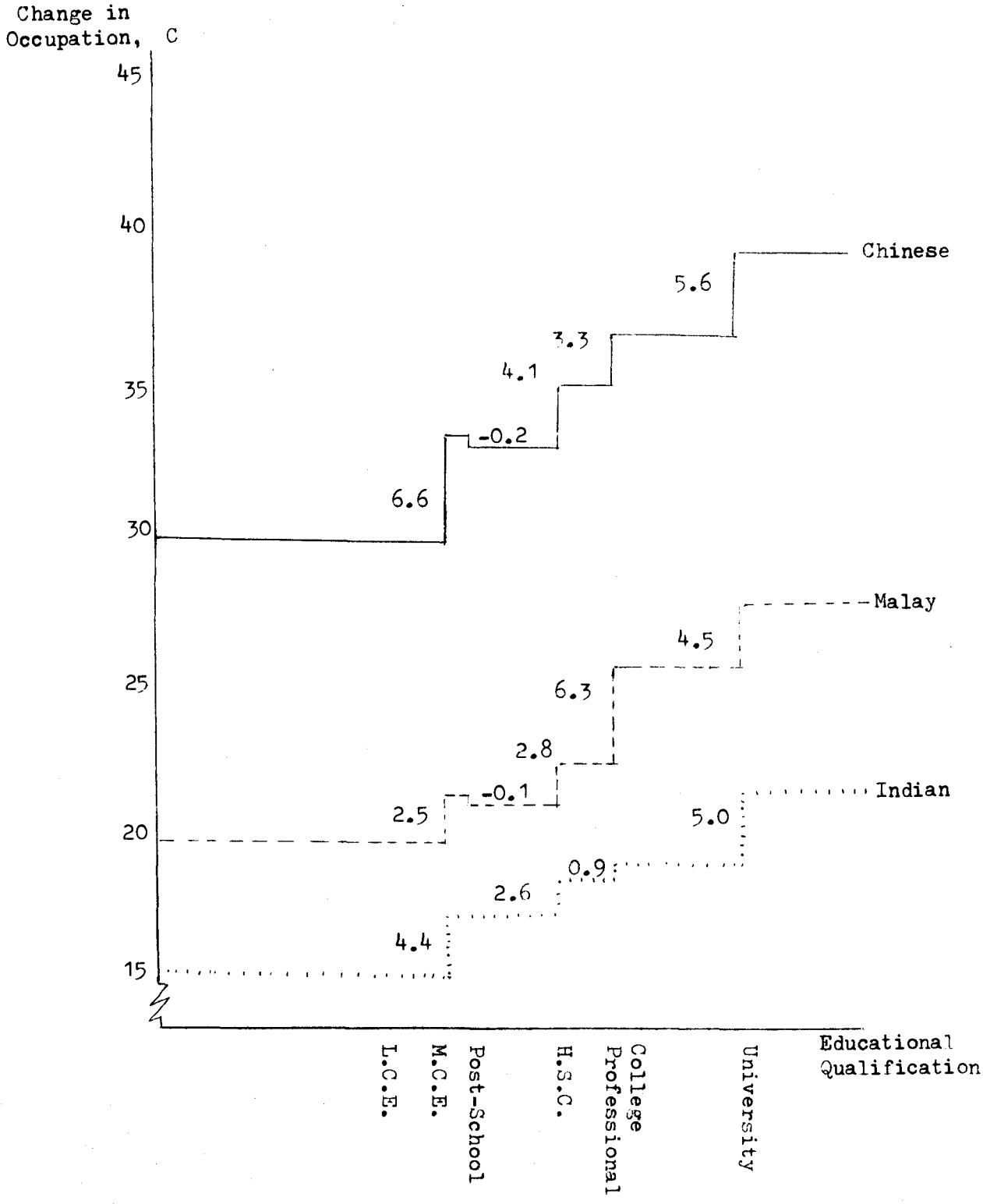

Figure 4: Marginal Impact of Education on Occupational Mobility: Public Sector

educational qualifications except at the college/professional level. At this level the Malays fare much better than the Chinese and Indians. Their marginal impact of over 6 points in terms of occupational mobility is nearly twice that of the Chinese, and about seven times that of the Indians. At the university level, the marginal impacts do not differ greatly.

In terms of school quality and medium of instruction, Malays with English-medium education have, on the average, a small 1-point advantage over Malays with non-English (mainly Malay) schooling. Malays educated in schools located in the state or district capital also enjoy, on the average, a 2-point advantage in terms of occupational mobility.

In terms of experience, Malays who first started work in the primary or secondary sectors rather than in the public sector experience a 4-point advantage in terms of occupational mobility. This is a reflection of the fact that Malays who leave the primary and secondary sectors for the public sector tend to move into better or more prestigious occupations. A similar situation exists for Indians who started their first full-time employment in the primary sector; here the advantage is almost 9 points. Public sector work experience has a significant impact on occupational mobility only for the Malays (the rate of change is $-0.318 + 0.034t_c$ which is positive after 9 years of service) but the impact is actually rather small. Where formal training is concerned, there is a significant positive impact only for the Chinese. Chinese with formal training provided for by the public sector enjoy, on the average, a 3-point advantage in terms of occupational mobility. Again, ethnic differences in the impact of formal training may be a reflection of the different types of formal training provided.

Among the family background variables, mother's education stands out for the Malays; the coefficient is positive and significant at the 5 percent level. Among the Indians father's education has a negative and significant coefficient at the 10 percent level.

IV Concluding Remarks

In terms of the impact of education on occupational prestige attainment the findings here point towards rather significant inter-racial differences. In the private sector sample the Chinese generally stand above the Malays and Indians, but at the tertiary level the impact is highest for the Malays.

Providing tertiary education can therefore be expected to raise the occupational attainment of the Malays but this will only benefit those who gain access to tertiary education. The majority will still be placed at a disadvantage compared to the Chinese. The principal cause here appears to be the substantial difference in estimated intercepts. As in wage differential models, this should be taken as another reflection of supply and demand conditions which calls for further investigation, taking into account an investigation of employment and recruitment practices. And if the Indians are indeed found to be at a greater disadvantage than the Malays then government action should also be taken on their behalf.

There are also significant inter-racial differences in terms of occupational mobility in the private sector sample. The occupational structure for upward occupational mobility seems least open for the Malays and most open for the Chinese. Further, the marginal impact of education on occupational mobility also appears highest for the Chinese. Between the Malays and the Indians the marginal impact of education on occupational mobility is generally higher for the former, but at the tertiary level the marginal impacts are substantially higher for the Indians. Again, there are significant differences in the estimated intercepts which place the Chinese well above the Indians, and the Indians above the Malays, reflecting again probable differences in supply and demand conditions, motivations and drive.

Where the public sector is concerned the major short-coming of this study lies in the inability to cover all categories of public sector employees, in particular the subordinate office workers, unskilled industrial and manual workers, and senior Division One officers. Nevertheless, the study does shed some light on differences in occupational attainment and mobility.

Within the occupational categories covered, the Chinese and Indians stand above the Malays in terms of the impact of education on occupational attainment. It is likely that this has resulted from employment practices which favour the Malays and also from differences in racial preferences. For instance, at the lower levels, such as in the protective services, government policies favour the Malays while at the same time few non-Malays are willing to join, prefering instead the white collar-jobs in the public service.

The main point to be made here is that, in spite of these differences, education has a significant role to play in terms of its impact on occupational attainment and mobility.

CHAPTER V

SUMMARY AND POLICY IMPLICATIONS

In this report a broad definition of the term 'population studies' has been adopted. This goes beyond the common definitions of demography (see United Nations 1958, Hauser and Duncan 1959, Bogue 1969, and Hawthorn 1970) to deal with the problem of societal restructuring. It is population studies to the extent that it considers the relationship between demographic and non-demographic variables. The line of causation runs from the former to the latter (see Lucas, et. al. 1980). However, it goes beyond this definition in that it examines one particular solution to the socio-economic woes experienced by Malaysia which are in no small measure consequences of demographic pressures in the form of a rapidly growing population, a typical LDC age-pyramid, and a plural society. In particular, the main emphasis of this study lies in education as a policy variable in the process of societal restructuring.

Demographic pressures in the form of a rapidly growing, youthful, plural population contribute greatly towards the forces calling for changes which are now basic facts of the political and economic life of modern Malaysia. In particular these demographic pressures have contributed towards the employment problem[1] and the problems of economic disparities within a plural society which must be grappled with. The latter is seen by the Government of Malaysia as the principal cause of national disunity. Indeed, the problem of national unity is the ultimate goal of all Malaysian development efforts. Within this context the government launched its New Economic Policy with the principal aim of achieving national unity through a reduction of the incidence of poverty irrespective of race, and the reduction of inter-racial disparities in occupational and earnings attainment. Adhering to the structural hypothesis of inter-racial disparities, the government has assigned an important role to education as a productivity-raising device. Education is seen as an important policy variable in societal restructuring, i.e. in achieving the two objectives of the New Economic Policy - the reduction of the incidence of poverty and inter-racial disparities in occupational and earnings attainment.[2]

In terms of the first objective, education must, as stated earlier, be productive in the economic sense and it must be an important determinant

of earnings differentials. In terms of the second there are two aspects. First, inter-racial earnings differentials must be attributed mainly to inter-racial differences in earnings characteristics or endowments rather than to differences in earnings structures or coefficients. Second, differences in educational endowments must be a significant factor in earnings differentials. In terms of inter-racial differences in occupational attainment, education can be an effective means of inter-racial occupational restructuring only if its impact on occupational attainment and mobility is larger for the disadvantaged group than for the advantaged group.

I Summary of Empirical Findings

At the onset it must be reiterated that the findings reported here are more precisely valid only for the samples used, and that all generalisations are made only as a matter of convenience. The findings here await verification from better sets of national data.

As a productivity-raising device Malaysian education has an inherent productive value. It is, except for lower secondary education, more highly valued by the competitive (private) sector than the non-competitive (public) sector. Education also appears to be an important determinant of earnings differentials not only in the public sector where wages tend to be geared to educational qualifications but also in the private sector. It appears that education can be an effective policy variable in the government's attempts to reduce the incidence of poverty. However, concern must be placed on the low returns to lower secondary education. There appears to be an oversupply of school leavers with the Lower Certificate of Education. This is not surprising given the rapid expansion of lower secondary education in the late 1960's following the abolition of the Malayan Secondary Schools Entrance Examination and the introduction of a nine-year universal education system in preference to the six-year system of the late 1950's and the early 1960's.

As a device for the reduction of inter-racial earnings differentials the choice of education as a policy variable holds some degree of optimism. This is particularly true in the public sector where such differentials are accounted for principally by inter-racial differences in earnings characteristics. However, in the private sector there appears to be less room for optimism; only about one-half of inter-racial differentials can

be accounted for by differences in earnings characteristics covered in this study. There is scope for reducing inter-racial differentials through the redistribution of educational opportunities and the expansion of such opportunities, but further research is necessary to determine the importance of excluded, yet important, variables such as the ability to succeed in the economic sphere, motivation and drive. Nevertheless, part of the problem of inter-racial earnings differentials lies in differences in occupational access.

There appear to be considerable inter-racial differences in the impact of education on occupational attainment and occupational mobility among the respondents in these samples. In the private sector the Chinese stand well above the Malays and Indians in terms of occupational attainment and the openness of their occupational structure. In the public sector, within the occupational categories covered, the non-Malays stand above the Malays in terms of the impact of education on occupational attainment. It is likely that this situation has arisen from employment policies which favour the Malays, and also from differences in racial preferences in employment in the public sector. Again, it must be emphasized that no account has been taken of differences in the ability to succeed in the economic sphere, nor has it been possible to account fully for motivation and drive.

II Some Policy Implications

Perhaps the simplest implication which one can draw from the empirical findings reported here, on the great assumption that they can be generalized, is that the emphasis given to education by the government as a policy variable in the restructuring of Malaysian society is well placed. The proponents of this simple policy conclusion might cite the not spurious correlation between education and earnings, and the relative importance of education in the explanation of earnings differentials as arguments in their favour. However, the problem is not so simple.

At this point, it is important to stress that the following discussion does not deal with the attainment of Malaysia's ultimate goal of national unity. Whether this is best served through the reduction of poverty and inter-racial disparities, or through some other means lies

beyond the realm of this discussion. The central concern here is with the way in which education can be more effectively used as a policy variable for societal restructuring.

In terms of poverty the empirical findings indicate that education can serve as an effective policy variable; again on the assumption that generalisations can be made. However, concern must be placed on the low returns to lower secondary education. Further expansion of lower secondary education may have only a marginal or minimal effect on the incidence of poverty. Here, reference is made only to the private returns to lower secondary education. Social returns are likely to be even lower (see Psacharopoulos, 1973).

The most common fallacy at this point would be to lay the blame on the educational authorities. The problem is not so simple. First, Malaysia's population is still growing rapidly. Further, with a typical LDC age-pyramid, additions of youth to the labour force will continue to remain high. To emphasize mismatches as the cause of the employment problem among youths is to miss the point. It appears that the existing wage structures enable some types of graduates to stay out of employment longer while at the same time discouraging blue-collar employment for which vacancies exist.

The often recommended solution lies in the argument that school leavers lack saleable skills, that the "majority of them enter the labour market unprepared either functionally or psychologically for the world of work" (Ministry of Education, 1971 , pp. 8-9). In line with this the basic policy, proposals centre around the ruralization and vocationalization of the curricular. However, as Forster (1966) has argued, the vocationalization and ruralization of the school curricular can never be an effective method of solving the problem. Essentially, the problem boils down to uncertainty about future demand for specific skills. This is not to deny the case for the 'ruralization' or 'vocationalization' but, rather, that it would be naive to expect schools to prepare pupils to take up clearly defined occupations.

Perhaps, as Forster emphasizes, the need is for more adequate general education at the primary and secondary levels since a necessary foundation for vocational training, which is generally more efficiently provided on the job rather than in schools, is a good general education. The basic idea is to provide sound general education with, probably,

a bias towards general science which will provide the basis for later on-the-job training or specialist training (see Forster, 1966, p. 155). Or, as Blaug puts it, "If, therefore, education contributes to economic growth it does so more by transforming the values and attitudes of students than by providing them with manual skills and cognitive knowledge; education is economically valuable not because of what students know but because of how they approach the problem of knowing" (Blaug, 1978, p. 38).

The basic fact remains that no one knows how to make education 'relevant' to meet the employment problem. What is needed now is, as Blaug argues, a series of controlled experiments (Blaug, 1978, p. 83). The educational authorities might experiment with non-formal education including education for self-reliance (see for instance Simmons, 1979). The idea is to link the programme to local needs and to keep it responsive to community pressures. The emphasis lies in the development of a critical awareness of the causes and consequences of poverty among those involved through group discussions, learning the skills of organisation and leadership, and extending productive skills. Where the public sector post-school training institutions are concerned it might be better to gear such training to on-going public development programmes.

In this context it is heartening to note that greater emphasis will in the future be placed on sound general education in Malaysian schools. In the last few months the government has made known its intentions to revert to the old system of education with emphasis on the 3R's, though it must be noted that the new curriculum will not be introduced until 1983.

Leaving aside the employment problem defined in terms of the creation of employment which affords a certain minimum standard of living, the study also indicates that the equalization of educational opportunities may not automatically imply inter-racial earnings equality. The basic problem here is that a considerable amount of the differentials can be attributed to differences in earnings structures, and occupational access. From this study it is impossible to say if discriminatory practices, as in Western societies, may be important factors since it has not been possible to account completely for differences in the ability to succeed in the economic sphere, motivation and drive.

The most reasonable policy implication here is that further research on a national scale is needed. If it should be found that discriminatory

practices are important then it would be necessary to devise policies which are directed against such practices. However, this is far easier said than done (see Doeringer and Piore, 1971, chapter 7). The basic problem is that recruitment, hiring, and promotion procedures are often made on the basis of both objective criteria, such as education, and in interviews where more subtle criteria such as speech and deportment are applied, the latter are often difficult to specify, and their informality permits practices of a discriminatory nature.

In Malaysia, race is probably often used as a screening criterion in recruitment and promotion. In the absence of an inexpensive way of uncovering the potential job performance of an applicant, race is perhaps the best alternative since it is probably the most inexpensive. Chinese employers who unknowingly adhere to the cultural hypothesis of inter-racial disparities for instance, with a customary idea of the 'lazy' Malay, may quite clearly 'discriminate' against a Malay job applicant even if he is in fact more productive than a Chinese applicant with similar educational qualifications and experience. So, racially 'discriminatory' practices may be customary in nature, and their complete elimination will require more than mere legislation; they may require change in custom itself.

In the final analysis quotas may be the best way to achieve the desired goals. Quotas can be viewed as an alternative to formalizing and validating screening procedures or specifying certain recruitment procedures. "Quotas have the advantage of specifying a desired set of results without tying the employer to a particular set of remedies which may be particularly inconsistent with efficient resolution of the problem .... Even where not binding, they may be an especially useful management instrument for convincing operating personnel of the need for demonstrating results as opposed to token compliance with remedial procedures" (Doeringer and Piore, 1971, pp. 152-153).

However, like the employment problem, such problems are probably best eliminated within the context of a growing economy rather than a stagnant economy. In the final analysis the employment (plus poverty) problem and the problem of inter-racial disparities are probably best solved within the context of an overall employment-oriented development programme coupled with efforts to improve the quality of general education.

APPENDIX I

The basic objective of the survey was to obtain information on the education, earnings, occupation, employment characteristics, and family background of full-time employees in Peninsular Malaysia. However, due to financial and time constraints, the scale of the final survey and the approaches adopted fall short of the original aim of a national random survey. The practical outcome is a two-part survey of full-time employees in the private sector and in the public sector in the Klang valley region which was conducted in the fall of 1978.

A.1 Sampling Methodology - Private Sector

The population that is the object of this study consisted of full-time employees in limited companies in Peninsular Malaysia. Although several listings of limited companies are available, only one was made available to the researcher, i.e. the Business Expectations Survey list of 220 limited companies for the first quarter of 1978.

The 220 limited companies were selected from a list of 8,265 limited companies, out of a total of 18,526 firms listed in the 1974 Financial Survey of Limited Companies, plus the companies operating in the Free Trade Zones obtained from the 1976 Monthly Manufacturing Survey, which responded to the Business Expectations Survey conducted by the Department of Statistics. These firms were selected on the following bases. The distribution of the sample by economic sectors was based on the respective sector's share in total gross revenue, employment, and net fixed assets. These variables were assigned equal weights in determining the distribution. The number of firms selected from each sector may be given by the following:

$$S_j = \left\{ w \left[\frac{\sum_i R_{ij}}{\sum_i \sum_j R_{ij}} + \frac{\sum_i N_{ij}}{\sum_i \sum_j N_{ij}} + \frac{\sum_i A_{ij}}{\sum_i \sum_j A_{ij}} \right] \right\} n$$

$$V_j = 1, 2, \ldots, 8$$

where Sj = number of firms selected from the j th. sector,

w = a weighting factor equal to 0.333,

n = total sample size,

R_{ij} = gross revenue of the i th. firm in the j th. sector,

N_{ij} = employment size of the i th. firm in the j th. sector,

A_{ij} = net fixed assets of the i th. firm in the j th. sector.

In the second stage, the selection of companies within each sector was based on revenue size with consideration being given to ensure a fair representation of industries in the sector. Every industry within the limits set by the sample size is represented by, at the least, the largest company in terms of gross revenue in that industry.

The final distribution of companies by economic sector is given in Table A.1. The 220 companies in the sample contributed 45.0 percent of the gross revenue, 31.7 percent of the employment, and 39.0 percent of the net fixed assets of the corporate sector covered in the 1974 Financial Survey of Limited Companies.[1]

Table A.1

Distribution of Sampled Companies
by Economic Sector

Sector	Total Number of Companies[a]	Companies in Klang Valley Region	
		Total	Number Responded
Rubber	35	3	2 (66.7)
Other Agriculture	10	0	- -
Mining	22	4	2 (50.0)
Manufacturing	75	45	17 (37.8)
Construction	12	8	4 (50.0)
Wholesale	30	25	10 (40.0)
Retail	20	18	9 (50.0)
Financial	16	16	8 (50.0)
Total	220	119	52 (43.7)

Note: Figures in parentheses refer to response rates.

a: See Department of Statistics, Business Expectations Survey: Peninsular Malaysia, First Quarter 1978, Kuala Lumpur: Department of Statistics, 1978.

Of the 220 companies, 119 were located and were found to be operating in the Klang Valley region of the country. This region covers the principal centres of development in Malaysia, and includes the federal capital, Kuala Lumpur, the state capital of Selangor, Shah Alam, and the major towns of Petaling Jaya, Batu Tiga, and Klang. As an indication of the importance of this region it may be noted that in 1972 this region alone accounted for some 43 percent of the total value added of the manufacturing sector and employed 31 percent of the full-time industrial work force in Peninsular Malaysia.[2]

Apart from the economic significance of the region there were two other reasons for confining the survey to the Klang Valley. First, the availability of financial resources, reliable manpower, and time proved inadequate for a more comprehensive coverage. Second, given that the private sector accounts for less than 45 percent of all diploma holders and about 30 percent of all degree holders in Peninsular Malaysia,[3] and the fact that over 40 percent of all degree holders actually reside in the major urban centres of Selangor state (Kuala Lumpur, Petaling Jaya, and Klang)[4] it was decided that, in terms of the most effective use of time and manpower, the survey should indeed be confined to this region.

Letters and a basic questionnaire relating to the firm and in particular to the nature of its workforce, together with a stamped-addressed envelope, were sent to each of the 119 firms. After a time interval of two weeks, during which private telephone calls were made to the personnel managers, only 11 firms had responded to the mail questionnaire. Out of the 11 firms only three had agreed to allow their employees to be interviewed.

An alternative, more personal, approach appeared necessary and was taken. Appointments were made with the personnel managers, and visits were made to the firms including those which had indicated in the returned questionnaires that they were not able to cooperate, and this resulted in a more favourable response, 52 of the 119 firms agreed to cooperate providing a response rate of 43.7 percent (see Table A.1).

From conversations with the personnel managers it was learnt that generally the firms did not reply to the mail-questionnaire because the information sought was either not readily available or in some cases confidential. For instance, records on personnel by sex, race, educational level and occupation were not readily available in aggregate form, and

could only be obtained at much cost to the firm in terms of time and personnel. On the other hand, information on fixed assets and changes in profits or growth rates, and information on the extent of foreign ownership were considered confidential in some cases.

With the 52 companies which agreed to cooperate, the next stage involved the selection and interviewing of their employees. Given that the sampling at the first stage was not random it was decided that at the second stage a quota sampling approach would suffice.

Given the financial resources that were available and the limited time within which the survey had to be conducted it was decided that the sample size for the private sector should be kept to 1200. A simple random sample at this stage would undoubtly produce proportionately more respondents with lower educational qualifications than those with higher, especially tertiary, qualifications. It was decided that the sampling fraction by educational level should be varied so as to generate more respondents with higher educational qualifications. There were two basic reasons for this decision. First, the emphasis of this study would preferably be on tertiary education which is currently undergoing very rapid expansion. Second, it pays to over sample the more variable strata; earnings are likely to be more variable for those with higher education than for those with lower education.

After further discussions with the personnel managers and officers of some of the firm which agreed to cooperate it was decided that the following sampling fractions would be acceptable:

Educational Level	Non-Manufacturing Firms	Manufacturing Firms
Degree	1/4	1/4
Professional/ College	1/4	1/4
Post-Schooling	1/4	1/4
Higher School Certificate	1/10	1/20
Malaysian Certificate of Education	1/10	1/20
Lower Certificate of Education	1/10	1/20
Primary	1/10	1/20
No Education	1/10	1/20

The final apportionments were to some extent determined by the degree of cooperation of the firms concerned, and there is no way of determining if the firms actually provided the numbers expected from them.

The interviews for this survey of the private sector were all conducted at the places of work by university students, most of whom have had some previous interviewing experience. They were nevertheless given some training for this particular survey to ensure that they would know exactly the purpose and nature of the study, and the sort of questions and answers sought for. They were instructed to interview physically fit men and women below the age of forty. The personnel managers were asked to provide respondents so as to reflect the racial and sex compositions of their respective firms at each educational level.

At this point, several limitations of the survey should be noted. Arising from the need to use the Business Expectations Survey list of companies, reducing this to those operating in the Klang Valley region, and further reducing the list to those companies which were willing to cooperate in the study, biases may be expected and generalisations to cover the country or even the Klang Valley region can only be made with extreme caution. The sample should be considered as a non-probability sample. No weights are then applied in the analyses since the data are not amenable to the development of a sampling theory that is model free.[5] Nevertheless, since the government considers these to be among the leading firms in the country, at least in terms of its Business Expectations Survey, these firms may in a sense be considered as trend setters. Important lessons could therefore be learnt from these firms.

Biases will also arise from the fact that those selected for the interviews may be those who are most readily available and they may differ systematically from those who are harder to locate. This is most obvious in the case of the manufacturing firms where on-line process workers were difficult to obtain. Nevertheless, where provided, they were interviewed after their work hours. Top management personnel were more difficult to locate but then they are likely to be in the older age categories.

The fact that the interviews were conducted in the places of work may also lead to some response biases since the employees may not give frank answers to the questions asked. However, interviewers were instructed to interview in privacy and to emphasize the confidential nature of the

survey. On the whole they reported that they did not detect any lack of cooperation on the part of the respondents.

Other response biases may also arise from the administering of the questionnaires, but these should have been kept to a minimum. The interviewers, as stated earlier, consisted mainly of those with interviewing experience and they were also chosen on the grounds that they were fluent in at least two languages.

A.2 Sampling Methodology - Public Sector

The population for this survey consists of all public sector employees or, more specifically, all Federal Government employees. The latest listing of all such employees comes from the second part of the 1973 Manpower Survey. The list covers all public sector employees except the categories of 'subordinate office workers (Division 4 Staff)', 'unskilled labourers (in the Industrial and Manual Group)', and Armed Forces personnel. Of the total of 435,166 (excluding Armed Forces personnel) some 300,417 public sector employees were included in the listing and of these 207,034 were Federal Government employees.

The survey was designed essentially to obtain information for the planning of human resources (manpower projections) for the Third Malaysia Plan, 1976-80, and the Outline of Perspective Plan, 1970-90. But the survey also yielded much information that would be useful for an analysis of the importance of education and the returns to education in the public sector. The Records Office, Public Services Department, indicated their willingness to assist where they could. Unfortunately the Office could not release the complete listing nor the detailed breakdown in the manner desired due to shortages of staff and expertise within the Office. Nevertheless the Office made available three tables which it had in readily accessible form (computer printouts). These tables provide cross-tabulations of the following types:

i. Occupation by Sex,
ii. Occupation by Race, and
iii. Occupation by Educational Attainment.

These tables covered all Federal Government employees except those categories stated earlier. The occupational classification was based on the 2-digit occupational classification given in the Dictionary of

Occupational Classification, Malaysia 1969. The educational categories were rather broad - those with the Higher School Certificate and below, those with vocational and technical education, and those with professional and university education.

Given the resources available, especially in terms of time and manpower, it was decided that a quota sampling approach would be most appropriate and that the sample size should be limited to 800. The sample would then be apportioned between the three educational levels defined in the tables provided in the following manner:

i. 300 professional and university,
ii. 200 vocational and technical, and
iii. 300 others.

The sample size for each category of educational qualification was apportioned proportionately between the occupational categories. An attempt was made to reflect the racial and sex composition of each occupational category. At the upper two levels of educational qualifications the apportionment was also made proportionately between the different fields of specialisation: arts, social sciences, pure science, applied science, medical science, agricultural science, commerce, and home science. The actual quotas for each occupation by educational level, race and sex may be given as follows:

Step A: Splitting the sample by educational level:

$$n^{e}_{ij} = \frac{e_{ij}}{\sum_{i} e_{ij}} N_j$$

where n^{e}_{ij} = number of respondents in the i th. occupation with the j th. level of education.

e_{ij} = number of employees in the i th. occupation with the j th. level of education,

N_j = sample size for the j th. level of education.

Step B: Splitting the sample between racial groups:

$$n^{r}_{ik} = \frac{r_{ik}}{\sum_{i} r_{ik}} \sum_{j} n^{e}_{ij}$$

where n^{r}_{ik} = number of respondents in the i th. occupation of the k th. ethnic group,

r_{ik} = number of employees in the i th. occupation of the k th. ethnic group.

Step C: Splitting the sample between sex groups:

$$n^{s}_{im} = \frac{s_{im}}{\sum_{i} s_{im}} \sum_{j} n^{e}_{ij}$$

where n^{s}_{im} = number of respondents in the i th. occupation of the m th. sex group,

s_{im} = number of employees in the i th. occupation of the m th. sex group.

As in the private sector survey, the interviewers for this survey were all either university students or college and university graduates who were still unemployed at the time of the survey. The latter were given the training which the former had undergone earlier. The interviewers were now given the exact quotas of interviews in terms of occupation, race, sex, and education including the field of specialisation where relevant. The interviewers were also instructed to interview only men and women below the age of forty with emphasis being given to those in their earlier years.

All interviews were conducted in the places of work, and for this reason the cooperation of the Heads of Departments proved vital. In general the response was good perhaps even better than in the case of the private sector. In general the Public Services Department provided the necessary information relating to the most probable places where the respondents of each particular occupation may be found and interviewed. In almost all cases the information provided proved very helpful.

At any rate, the interviews were conducted in the same region as the private sector survey. This is in fact the best place since Kuala Lumpur is the capital city and the seat of government. Besides, there are no regional differences in public sector earnings between regions except for those who are posted to the East Malaysian states of Sabah and Sarawak and for those from Sabah and Sarawak who are posted to Peninsular Malaysia.[6]

The limitations in this study are somewhat similar to those in the private sector survey. It is again difficult to generalise because of the nature of the sampling conducted. The inability to obtain a detailed breakdown of federal employees by occupation, education, race and sex proved to be a major limitation of the exercise. Further, in a few instances respondents could not be found; this was particularly true of the category 'agricultural, animal husbandry, and forestry workers' (Malaysian Occupational Classification Codes 60, 62 and 63). There was at least one case in which no respondent could be found who would fall within the age limit set, i.e. in the case of 'government executive officials' (MOC Code 31). Finally, given the time and manpower constraints on hand some occupational groups were less well covered than others; this was particularly true in the case of male teachers (MOC Code 13). Biases may also arise from the fact that those interviewed may be those who were more responsive or more cooperative.

A.3 Concluding Remarks

Given the limitations faced in conducting the surveys biases may be expected in the findings from this study. The study might best be considered as an exploratory study. It has serious limitations arising from the sampling methodologies adopted. Nevertheless, it is hoped that the findings of this study will provide important insights into the actual significance of education as a policy variable for the attainment of Malaysia's New Economic Policy goals.

QUESTIONNAIRE

Introduction: This survey has been designed to obtain information which will be used to study the effects of education and other socio-economic factors on a person's earnings and occupation. You can help us greatly if you will answer the questions below. The information you give will be kept <u>strictly confidential</u>.

i. Card Number — 1 4

ii. Respondent Number — 5 8

iii. Respondent Card Number — 9

iv. Establishment Number (Private Sector Only) — 10 11

PART I: PERSONAL CHARACTERISTICS

1. Sex: Female(1) Male(2) — 12

2. Race: Malay(1) Chinese(2) Indian(3) Other(4) — 13

3. When were you born (year)? — 14 15

4. Where were you living up to age six? — 16

   Gazetted City or Municipality(1)
   State Capital or District Capital(2)
   Other Urban Area(3)
   Rural Area(4)

5. What is your nationality? — 17

   Malaysian(1)
   Singaporean(2)
   Other - Specify: .....

6. Are you the only child in the family? — 18

   No(1) Yes(2)

   [IF 'no' Go To Question 7
   IF 'yes' Go To Question 11]

7. How many brothers do you have? — 19 20

8. How many sisters do you have? — 21 22

9a. IF Respondent is FEMALE: What is your birth position among your sisters? 2324

9b. IF Respondent is MALE: What is your birth position among your brothers? 2526

10. What is your birth position among your brothers and sisters? 2728

11. What is your present marital status? 29

Single(1) Married(2) Other(3)

[IF 'married' Go To Question 12
IF 'single' or 'other' Go To Question 16]

12. Is your spouse working? No(1) Yes(2) 30

[IF 'no' Go To Question 16
IF 'yes' Go To Question 13]

13. Does your spouse work in the private sector or in the public sector? 31

Private(1) Public(2)

14. What is the present occupation of your spouse? ..... 3233 MOC

15. When were you married (year)? 3435

16. How many dependents do you have? 3637

PART II: EDUCATIONAL ATTAINMENT

PART IIA: Kindergarten

1. Did you attend kindergarten? No(1) Yes(2) 38

[IF 'no' Go To Part IIB]

2. What type of kindergarten was it? 39

Private(1) Missionary(2) Other(3)

3. What was the language of instruction? 40

Malay(1) English(2) Chinese(3)
Other(4)

4. Where did you go to attend kindergarten? 41

Gazetted City or Municipality(1)
State or District Capital(2)
Other Urban Area(3)
Rural Area(4)

5. How long did you spend in kindergarten (months)? 42 43

PART IIB: Primary School

6. Did you attend primary school? No(1) Yes(2) 44
   [IF 'no' Go To Part III]

7. What type of school was it? 45
   Government(1) Government Assisted(2)
   Private(3) Other(4)

8. What was the main language of instruction? 46
   Malay(1) English(2) Chinese(3)
   Other(4)

9. Where was your school located? 47
   Gazetted City or Municipality(1)
   State or District Capital(2)
   Other Urban Area(3)
   Rural Area(4)

10. In what year did you start primary schooling? 48 49

11. When did you stop primary schooling? 50 51

12. Did you complete primary schooling? 52
    No(1) Yes(2)
    [IF 'no' Go To Question 15]

13. Did you sit for the Malayan Secondary Schools Entrance Examination (conducted between 1956 and 1964, inclusive)? 53
    No(1) Yes(2)
    [IF 'no' Go To Part IIC]

14. What grade did you obtain? 54
    Grade A(1) Grade B(2) Grade C(3)
    Failed(4)

    Go To Part IIC

15. What was the highest standard you attended? 55

PART IIC: Secondary School

16. Did you undertake secondary schooling? 56
    No(1) Yes(2)
    [IF 'no' Go To Part IID]

17. What was the highest level of secondary schooling which you attended? 57

Lower Secondary(1)
Upper Secondary(2)
Pre-University(3)

18. What type of lower secondary school was it? 58

Government(1) Government Assisted(2)
Private(3) Other(4)

19. What was the main language of instruction? 59

Malay(1) English(2) Chinese(3)
Other(4)

20. Where was your school located? 60

Gazetted City or Municipality(1)
State or District Capital(2)
Other Urban Area(3)
Rural Area(4)

21. In what year did you start lower secondary schooling? 6162

22. Did you attend remove class? 63

No(1) Yes(2)

23. When did you stop lower secondary schooling? 6465

24. What was the highest form you attended? 66

25. Which examination did you attempt? 67

None(1) L.C.E.(2) S.R.P.(3)
Other(4)

26. What grade did you obtain? 68

Grade 1(1) Grade 2(2) Grade 3(3)
Failed(4)

27. Did you undertake any form of upper secondary schooling? 69

No(1) Yes(2)

[IF 'no' Go To Part IID]

28. What type of upper secondary school was it? 70

Government(1) Government Assisted(2)
Private(3) Other(4)

29. What was the main language of instruction? 71

Malay(1) English(2) Chinese(3)
Other(4)

30. What educational stream were you in? 72

Arts(1) Science(2) Vocational(3)
Technical(4)

31. Where was your school located? 73

Gazetted City or Municipality(1)
State or District Capital(2)
Other Urban Area(3)
Rural Area(4)

32. In what year did you start upper secondary schooling? 7475

33. When did you stop upper secondary schooling? 7677

34. Did you attempt the final fifth form examination? 78

No(1) Yes(2)

[IF 'no' Go To Part IID]

35. Which examination did you attempt? 79

M.C.E.(1) S.P.M.(2) M.C.V.E.(3)
Other(4)

36. What grade did you obtain? 80

Grade 1(1) Grade 2(2) Grade 3(3)
G.C.E.(4) Failed(5)

i. Card Number 1 4

ii. Respondent Number 5 8

iii. Respondent Card Number 9

37. Did you attempt any form of pre-university education? 10

No(1) Yes(2)

[IF 'no' Go To Part IID]

38. What type of pre-university school was it? 11

Government(1) Government Assisted(2)
Private(3) Other(4)

39. What was the main language of instruction? 12

Malay(1) English(2) Chinese(3)
Other(4)

40. What educational stream were you in? 13

Arts(1) Science(2) Technical(3)

41. Where was your school located? 14

Gazetted City or Municipality(1)
State or District Capital(2)
Other Urban Area(3)
Rural Area(4)

42. In what year did you start pre-university education? 15 16

43. When did you stop pre-university education? 17 18

44. Did you attempt the final examination? 19

No(1) Yes(2)

[IF 'no' Go To Part IID]

45. Which examination did you attempt? 20

H.S.C.(1) S.T.P.(2) Other(3)

46. What grade did you obtain? 21

Full Certificate(1) Statement(2)
Failed(3)

PART IID: Post-Schooling Education

47. Did you undertake any form of post-schooling education? 22

No(1) Yes(2)

[IF 'no' Go To Part III]

48. What type of post-schooling education did you undertake? 23

Commercial(1) Agricultural(2)
Technical(3) Teacher Training(4)
University(5) Other: .....(6)

[IF 'university' Go To Question 61]

49. What was the minimum entrance requirement? 24

Primary education(1)
L.C.E. or equivalent(2)
M.C.E. or equivalent(3)
H.S.C. or equivalent(4)
Other: .....(5)
Do not know(9)

50. Was it a private or public institution? 25

Government(1) Private(2)
Correspondence(3)

51. What was the main language of instruction? 26

Malay(1) English(2) Other(3)

52. In what year did you start your course? 27 28

53. Was it on a full-time or part-time basis? 29

Part-time(1) Full-time(2)

54. What was the normal duration of the course (months)? 30 31

55. Where did you go for the course? 32

Gazetted City or Municipality(1)
State or District Capital(2)
Other Urban Area(3)
Rural Area(4)
Overseas(5)

56. What type of certificate or diploma did you attempt? 33

Commercial Certificate(1)
Commercial Diploma(2)
Technical Certificate(3)
Technical Diploma(4)
Teacher Training Diploma(5)
Professional Commercial(6)
Professional Technical(7)
Other: .....(8)

57. Did you complete the course? 34

No(1) Continuing(2) Yes(3)

[IF 'continuing' Go To Part III]

58. When did you stop the course? 35 36

[IF respondent has completed course Go To Question 59
IF respondent has not completed course Go To Question 60]

59. What grade did you obtain? 37

Credit rating(1)
Pass rating(2)
Do not recall but passed(3)
Failed(4)

60. Did you attend university? 38

No(1) Yes(2)

[IF 'no' Go To Part III]

61. Where did you go to attend university? 39

Malaysia(1) Singapore(2)
U.K.(3) Australia(4)
New Zealand(5) Canada(6)
U.S.A.(7) Other: .....(8)

62. Which university did you attend? 40

Malaya(1) Sains Malaysia(2)
Kebangsaan(3) Pertanian(4)
Teknoloji(5) Singapore(6)
Nanyang(7) Other: .....(8)

63. What was your main field of study? 41

Arts(1) Social Science(2)
Pure Science(3) Applied Science(4)
Medical Science(5) Agricultural Science(6)
Commerce(7) Home Science(8)

64. What was the main language of instruction? 42

Malay(1) English(2) Other(3)

65. In what year did you start your course? 4344

66. Was it on a full-time or part-time basis? 45

Part-time(1) Full-time(2)

67. What was the normal duration of the course (years)? 46

68. When did you stop the course? 4748

69. Did you attempt the final examination? 49

No(1) Yes(2)

[IF 'no' Go To Part III]

70. What grade or class of honours did you obtain? 50

First(1) Second Upper(2)
Second Lower(3) Third(4)
Pass Degree(5) Failed(6)

71. Did you undertake any form of post-graduate 51

No(1) Yes(2)

[IF 'no' Go To Part III]

72. What type of post-graduate education did you undertake? 52

Diploma(1) Masters(2)
Doctorate(3) Other: .....(4)

73. Where did you go for this course? 53

Malaysia(1) Singapore(2)
U.K.(3) Australia(4)
New Zealand(5) Canada(6)
U.S.A.(7) Other: .....(8)

74. Which university or college did you attend? 54

Malaya(1) Singapore(2)
Other: .....(3)

75. What was your main field of study? 55

Arts(1) Social Science(2)
Pure Science(3) Applied Science(4)
Medical Science(5) Agricultural Science(6)
Commerce(7) Home Science(8)

76. What was the main language of instruction? 56

English(1) Other: .....(2)

77. In what year did you start the course? 5758

78. Was it on a full-time or part-time basis? 59

Part-time(1) Full-time(2)

79. What was the normal duration of the course (months)? 6061

80. When did you stop attending the course? 6263

81. Did you attempt the final examination? 64

No(1) Yes(2)

[IF 'no' Go To Part III]

82. Were you successful in that examination? 65

No(1) Yes(2)

PART III: JOB CHARACTERISTICS

1. What is your present occupation? MOC 6667

Manager or Senior Executive(1)
Professional(2)
Middle or Junior Executive(3)
Supervisory Work(4) 68
Technical or Skilled Work(5)
Clerical or Sales Work(6)
Production Work(7)
Service Work(8)
Other(9)

2. When did you start on your present position (month and year)? 6970 Month

7172 Year

3. Did you receive any formal training for this present job? 73

No(1) Yes(2)

[IF 'no' Go To Question 5]

i. Card Number 1 4

ii. Respondent Number 5 8

iii. Respondent Card Number 9

4. Which of the following types of formal training did you receive for this present job and for how long (weeks)?

Apprenticeship 10 12

Formal Training Within Firm 13 15

Specialised Training Institutions 16 18

Overseas Training 19 21

Other: 22 24

5. What is your present monthly salary (gross)? 25 28

6. How many months bonus are you likely to receive this year? 2930

7. How much overtime compensation will you earn this month? 31 33

8. What is the percentage contribution made to the EPF by your employer? 34 36

9. Is there a pension scheme in your firm and what is your employers contribution to your pension fund? 37 39

10. How much meal allowance do you expect to receive this month? 40 42

11. How much transport allowance do you expect to receive this month? 43 45

12. How much housing allowance do you expect to receive this month? 46 48

13. How much insurance premium does your employer pay for you? 49 51

14. How many days paid leave are you entitled per year? 5253

15. How many weeks medical leave are you entitled per year? 5455

16. Do you receive any other allowance (type and value)? 56 59

17. Do you receive any of the following benefits?

Medical Care: No(1) Yes(2) 60

Dental Care: No(1) Yes(2) 61

Discounts on Products: No(1) Yes(2) 62

18. When did you join your present firm or employer (month and year)? 6364 Month

6566 Year

19. Have you held the same job since then? 67

No(1) Yes(2)

[IF 'no' Go To Question 20
IF 'yes' Go To Question 22]

20. How many different jobs have you held in your present firm or with your present employer? 6869

21. What was your first job or occupation with your present employer? ..... 7071 MOC

Manager or Senior Executive(1)
Professional(2)
Middle or Junior Executive(3)
Supervisory Work(4) 72
Technical or Skilled Work(5)
Clerical or Sales Work(6)
Production Work(7)
Service Work(8)
Other(9)

22. Did you work elsewhere before joining your present employer? 73

No(1) Yes(2)

[IF 'no' Go To Question 24]

23. When did you start on your first full-time employment (month and year)? — 7475 — Month

i. Card Number — 1 4

ii. Respondent Number — 5 8

iii. Respondent Card Number — 9

24. How long did you spend looking for your first full-time employment (weeks)? — 10 12

25. What was your first full-time job or occupation? ..... — 1314 — MOC

Manager or Senior Executive(1)
Professional(2)
Middle or Junior Executive(3)
Supervisory Work(4)
Technical or Skilled Work(5)
Clerical or Sales Work(6)
Production Work(7)
Service Work(8)
Other(9)

— 15

26. Where were you first employed on a full-time basis? — 16

Private Sector(1)
Private Educational Institution(2)
Public Sector(3)
Public Educational Institution(4)
International Organisation(5)
Self-employed(6)

27. In which of the following sector were you first employed on a full-time basis? — 17

Agriculture(1) Mining(2)
Manufacturing(3) Construction(4)
Utilities(5) Transport(6)
Commerce(7) Service(8)

28. How long did you stay in your first full-time occupation (months and years)? — 1819 — Months

— 2021 — Years

29. What was your first starting salary (gross)? — 22 25

30. How many employers have you had excluding your present one? — 2627

31. Did you receive any form of formal training from your previous employer(s)? 28

No(1) Yes(2)

[IF 'no' Go To Question 33]

32. Which of the following types of formal training did you receive and for how long (weeks)?

Apprenticeship 29 31

Formal Training within Firm 32 34

Specialised Training Institution 35 37

Overseas Training 38 40

Other: 41 43

33. Have you ever been unemployed since your first full-time employment? 44

No(1) Yes(2)

[IF 'no' Go To Question 35]

34. What is the total length of unemployment which you have experienced since your first full-time employment (weeks)? 45 47

35. Are you a member of a trade union? 48

No(1) Yes(2)

36. Do you have any wage bargaining in your present firm for workers in your category? 49

No(1) Yes(2)

PART IV: FAMILY PROFILE

1. What is or was your father's occupation (specify)? ..... 5051 MOC

Manager or Senior Executive(1)
Professional(2)
Middle or Junior Executive(3)
Supervisory Work(4) 52
Technical or Skilled Work(5)
Clerical or Sales Work(6)
Production Work(7)
Service Work(8)
Other(9)

2. Where is or was your father employed? 53

Private Sector(1)
Private Educational Institution(2)
Public Sector(3)
Public Educational Institution(4)
International Organisation(5)
Self-employed

3. Can your father read and write? 54

No(1) Yes(2)

4. What is your father's highest level of education? 55

No Education(1) Primary(2)
Secondary(3) College(4)
University(4)

5. Is or was your mother working? 56

No(1) Yes(2)

[IF 'no' Go To Question 8]

6. What is or was your mother's occupation (specify)? ..... 5758 MOC

Manager or Senior Executive(1)
Professional(2)
Middle or Junior Executive(3)
Supervisory Work(4) 59
Technical or Skilled Work(5)
Clerical or Sales(6)
Production(7)
Service(8)
Other(9)

7. Where is or was your mother working? 60

Private Sector(1)
Private Educational Institution(2)
Public Sector(3)
Public Educational Institution(4)
International Organisation(5)
Self-employed(6)

8. Can your mother read and write? 61

No(1) Yes(2)

9. What is your mother's highest level of education? 62

No education(1) Primary(2)
Secondary(3) College(4)
University(5)

PART V: FIRM CHARACTERISTICS (Private Sector Obly)

1. Firm Code — 63 64

2. Firm Employment Size — 65 68

3. Domestic or Foreign Firm: — 69

   Domestic(1) Foreign(2)

4. Firm Sector: — 70

   Agriculture(1) Mining(2)
   Manufacturing(3) Construction(4)
   Retail(5) Wholesale(6)
   Financial(7)

PART VI: INTERVIEW COMMENTS

1. The respondent was: — 71
   Very Cooperative(1)
   Cooperative(2)
   Indifferent(3)
   Uncooperative(4)
   Very Uncooperative(5)

2. Time taken for interview (minutes) — 72 73

Regression Estimates of Structural Form of Earnings Function
Males, Private Sector Sample

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
Constant	4.522		4.427		4.603	
S	-0.085[b] (2.376)	11.742	-0.035 (0.948)	13.121	-0.115[a] (2.672)	10.649
S^2	0.010[a] (6.798)	152.049	0.007[a] (4.877)	185.147	0.012 (6.024)	128.940
S_e	0.230[a] (3.507)	0.686	0.282 (0.292)	0.868	0.059 (0.448)	0.813
S_g	0.209[a] (2.999)	0.771	0.106[c] (1.625)	0.492	0.312[a] (3.141)	0.560
S_a	0.172[c] (1.670)	0.089	0.142[b] (2.146)	0.289	0.412[a] (3.952)	0.261
S_c	-0.016 (0.241)	0.416	-0.015 (0.237)	0.602	0.090 (0.935	0.418
t	0.108[a] (6.523)	6.530	0.089[a] (5.915)	7.668	0.114[a] (5.217)	8.120

cont'd

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
t^2	-0.003[a] (4.249)	69.215	-0.002[a] (2.636)	84.120	-0.003[a] (3.852)	98.000
FT	0.055 (0.937)	0.212	0.135[b] (2.345)	0.206	0.059 (0.554)	0.127
UNION	-0.268[a] (4.879)	0.590	-0.313[a] (5.704)	0.371	-0.299[a] (3.288)	0.694
FORFIRM	0.102[b] (2.130)	0.433	0.253[a] (5.029)	0.453	0.168[b] (2.416)	0.537
FIRMSIZE	0.00001 (0.1617)	612.952	0.00005 (0.701)	492.074	0.0003[b] (2.391)	521.157
TERSECT	-0.061 (0.426)	0.539	0.188 (1.001)	0.544	-0.161 (1.021)	0.299
SECSECT	-0.120 (0.884)	0.420	0.047 (0.256)	0.440	-0.191 (1.365)	0.590
QUITS	-0.050[b] (2.420)	0.833	-0.023 (1.422)	1.168	-0.063[b] (2.143)	1.045

cont'd

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
MARRIED	0.208[a] (3.339)	0.447	0.225[a] (3.925)	0.492	0.039 (0.420)	0.440
NODEP	0.010 (0.947)	2.492	0.028[b] (1.968)	2.104	0.009 (0.559)	3.276
MED	-0.007 (0.858)	2.707	-0.002 (0.236)	2.522	-0.003 (0.223)	2.567
MOC	0.001 (0.193)	40.754	0.004 (0.698)	41.052	0.008 (1.111)	39.776
FED	0.019[a] (2.792)	5.208	0.009 (1.511)	5.264	0.017[c] (1.809)	4.634
FOC	0.002 (1.259)	41.188	0.003 (1.433)	39.371	-0.002 (0.626)	35.396
CE_1	0.011 (0.169)	0.304	0.041 (0.662)	0.484	-0.120 (1.246)	0.328
FAMSIZE	0.012 (1.404)	6.713	-0.001 (0.143)	6.393	-0.011 (0.801)	6.388

cont'd

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
FLBCHILD	0.035 (0.678)	0.375	0.003 (0.063)	0.368	-0.078 (0.961)	0.313
$\bar{R}^2$	0.803		0.753		0.757	
F	50.600		47.148		18.247	
Number of Cases	293		364		134	

Figures in parentheses are t-ratios

a: significant at the 0.01 level
b: significant at the 0.05 level
c: significant at the 0.10 level

Regression Estimates of Structural Form of Earnings Functions: Females, Private Sector Sample

Regression Number	1		2	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable
Constant	3.812		3.730	
S	-0.140[a] (2.786)	11.276	-0.061 (1.258)	11.899
S^2	0.014[a] (6.119)	138.164	0.011[a] (5.279)	148.221
S_e	0.045 (0.504)	0.716	-0.081 (0.729)	0.889
S_g	0.144 (1.370)	0.761	0.171[b] (2.139)	0.567
S_a	0.351[a] (2.670)	0.127	0.193[b] (2.359)	0.313
S_c	0.082 (0.924)	0.433	0.011 (0.177)	0.631
t	0.089[a] (3.573)	4.396	0.097[a] (5.296)	4.885
t^2	-0.001 (0.794)	31.713	-0.002[c] (1.895)	38.055
FT	0.101 (0.932)	0.119	0.091 (1.140)	0.092
UNION	-0.062 (0.922)	0.470	-0.107[c] (2.012)	0.378
FORFIRM	0.041 (0.530)	0.358	0.224[a] (4.376)	0.350
FIRMSIZE	0.0001 (1.140)	570.187	0.00008 (0.914)	457.281
TERSECT	0.729 (1.633)	0.508	0.310[b] (2.000)	0.659

cont'd

Regression Number	1		2	
Race	Malay	Independent Variable	Chinese	Independent Variable
SECSECT	0.667 (1.517)	0.485	0.195 (1.247)	0.318
QUITS	-0.025 (0.569)	0.500	-0.009 (0.493)	0.977
MARRIED	0.047 (0.625)	0.351	0.145[b] (2.479)	0.286
NODEP	0.017 (1.239)	1.672	0.009 (0.737)	1.134
MED	-0.002 (0.215)	3.470	0.002 (0.235)	3.290
MOC	0.001 (0.232)	40.828	0.009 (1.545)	41.148
FED	0.011 (1.310)	5.799	0.004 (0.700)	5.369
FOC	0.006[b] (2.144)	43.955	0.0004 (0.224)	40.590
CE_1	-0.094 (0.992)	0.343	-0.053 (0.793)	0.571
FAMSIZE	0.009 (0.752)	6.410	-0.002 (0.162)	5.926
FLBCHILD	-0.047 (0.710)	0.373	0.040 (0.825)	0.424
$\bar{R}^2$	0.818		0.783	
F	25.947		33.454	
Number of Cases	134		217	

Figures in parentheses are t-ratios

a: significant at the 0.01 level
b: significant at the 0.05 level
c: significant at the 0.10 level

Regression Estimates of Structural Form of Earnings Function:
Males, Public Sector Sample

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
Constant	3.971		3.849		3.112	
S	0.134[a] (17.232)	13.560	0.149[a] (14.781)	15.259	0.172 (8.534)	14.122
S_e	0.090[c] (1.806)	0.662	-0.024 (0.191)	0.955	0.318 (1.105)	0.974
S_g	0.022 (1.152)	0.799	0.244[a] (2.927)	0.549	0.065 (0.528)	0.615
S_a	0.154 (1.581)	0.063	0.216[b] (2.521)	0.338	0.244[c] (1.693)	0.205
S_c	0.061 (1.152)	0.361	-0.061 (0.917)	0.639	-0.031 (0.260)	0.667
t	0.050[a] (3.865)	6.896	0.034[b] (2.137)	7.564	0.072[c] (1.849)	8.505
t^2	-0.0006 (1.081)	76.725	0.0008 (1.075)	93.085	-0.002 (1.148)	94.845

cont'd

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
FT	-0.034 (0.740)	0.320	-0.140[b] (2.226)	0.218	0.057 (0.515)	0.308
QUITS	-0.034 (1.328)	0.420	-0.025 (0.709)	0.384	-0.047 (0.776)	0.397
MARRIED	-0.092[c] (1.677)	0.480	0.114 (1.624)	0.571	0.034 (0.332)	0.564
NODEP	0.045[a] (4.597)	2.561	-0.008 (0.478)	1.940	-0.022 (0.901)	2.462
MED	-0.007 (0.997)	2.416	-0.013 (1.589)	2.722	0.005 (0.328)	3.705
MOC	0.008 (1.230)	40.617	0.007 (1.422)	40.503	0.004 (0.407)	41.449
FED	0.005 (0.750)	4.628	0.002 (0.295)	4.910	-0.001 (0.054)	6.513
FOC	0.004[b] (2.260)	40.461	0.004[c] (1.737)	37.436	0.005 (1.311)	43.897
CE_1	-0.062 (1.086)	0.223	0.011 (0.167)	0.444	-0.055 (0.471)	0.410

cont'd

Regression Number	1		2		3	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable	Indian	Mean of Independent Variable
FAMSIZE	-0.019[b] (2.259)	6.327	-0.018 (1.351)	5.684	(0.397)	5.744
FLBCHILD	-0.055 (1.176)	0.368	-0.023 (0.392)	0.361	0.062 (0.661)	0.385
$\bar{R}^2$	0.709		0.707		0.646	
F	37.249		18.724		8.822	
Number of Cases	269		133		78	

Figures in parentheses are t-ratios

a: significant at the 0.01 level
b: significant at the 0.05 level
c: significant at the 0.10 level

Regression Estimates of Structural Form of Earnings Functions: Females, Public Sector Sample

Regression Number	1		2	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable
Constant	3.676		3.750	
S	0.150[a] (16.245)	13.347	0.169[a] (15.429)	14.777
S_e	0.009 (0.190)	0.680	0.056 (0.396)	0.975
S_g	0.348[a] (4.746)	0.796	-0.006 (0.076)	0.512
S_a	0.362[a] (3.943)	0.122	0.077 (0.970)	0.397
S_c	0.094[c] (1.815)	0.245	-0.068 (1.228)	0.546
t	0.052[a] (3.260)	6.593	0.068[a] (4.374)	7.321
t^2	-0.0007 (0.841)	66.141	-0.0004 (0.498)	78.443
FT	-0.061 (1.125)	0.197	-0.107[c] (1.731)	0.141
QUITS	-0.156[a] (5.248)	0.347	-0.158[a] (3.869)	0.182
MARRIED	0.187[a] (3.628)	0.605	-0.003 (0.051)	0.686
NODEP	0.004 (0.398)	2.007	0.013 (1.038)	1.686
MED	0.010 (1.511)	2.905	0.010 (1.578)	3.942
NOC	0.004 (0.829)	41.490	0.0004 (0.110)	41.422

cont'd

Regression Number	1		2	
Race	Malay	Mean of Independent Variable	Chinese	Mean of Independent Variable
FED	-0.002 (0.259)	5.796	-0.009 (1.449)	5.785
FOC	0.001 (0.708)	42.735	0.002 (0.944)	40.579
CE_1	0.141[b] (2.437)	0.191	0.011 (0.208)	0.438
FAMSIZE	-0.011 (1.654)	6.612	0.001 (0.165)	6.397
FLBCHILD	-0.022 (0.511)	0.361	0.030 (0.658)	0.422
$\bar{R}^2$	0.806		0.810	
F	34.736		29.408	
Number of Cases	147		121	

Figures in parentheses are t-ratios

a: significant at the 0.01 level
b: significant at the 0.05 level
c: significant at the 0.10 level

FOOTNOTES

Chapter I

1. Throughout this report the term 'Malaysia' is used in reference to 'Peninsular Malaysia' unless otherwise stated.

2. The first census was taken in 1911.

3. The period in question, n, is given by in ln 2/r, where ln 2 is the natural logarithm of 2 and r is the rate of population growth.

4. Present trends indicate a mean annual rate of decline of 2.35 percent in total fertility; see Datin Nor Laily Aziz, et.al. 1979, pp. 6-7.

5. For a succint discussion of the definition of 'the quality of life' and the effects of population growth on the quality of life see Corsa and Oakley (1979).

6. The incremental capital output ratio (ICOR) measures the amount of net investment required to generate a unit increase in GNP, i.e. ICOR = $\Delta K/\Delta Y$, where ΔK is net investment and ΔY the change in GNP.

7. Part of the unemployment problem experienced by youths can be attributed to the world-wide economic recession that hit most countries in the 1970's.

8. There is general agreement on the increase in inter-racial disparity although this is difficult to demonstrate conclusively; see Lim (1971), Hirschman (1974), and Snodgrass (1980).

9. The first Five-Year Plan, 1956-60, was formulated in 1955, two years prior to independence, and its objectives are basically different from those of its successors.

10. For details see Malaysia 1961, p. 16; 1966, p. 2; 1971, Chapter 4; and 1976, Chapters 1 and 4.

11. This diagnosis is highly debatable; see for instance Loh (1975).

12. On the structural hypothesis and its relevance to Malaysia see: a) Fisk (1962), b) Ungku Aziz (1964, 1965, 1967). On the cultural hypothesis see: a) Silcock (1965), b) Parkinson (1967), Esman (1972). For a succint summary of the arguments and their implications see Snodgrass (1980).

13. Some biases must therefore be expected in the empirical analyses especially in cases where the education variable is represented by a continuous variable. It is unfortunately not possible to determine the extent of the biases.

14. On the importance of this crucial assumption of perfect competition see Blaug (1972).

Chapter II

1. For some formal treatment of the screening hypothesis see Arrow (1973), Spence (1973), and Stiglitz (1975).

2. The empirical results reported here have been published in another paper; see Lee (1980).

3. For a formal exposition of the theory of optimal allocation of post-schooling investment in human capital, see Ben-Porath (1967).

4. The introduction of interaction terms such as St and St^2 also have a theoretical basis. The basic Mincerian semi-logarithmic earnings function yields a valid estimate of the rate of return to schooling per se only if post-schooling investment and the rate of return to post-schooling investment are independent of the amount of schooling. A necessary, though not sufficient, condition for this to be true is that the experience-earnings profiles are parallel for all educational levels. If this does not hold, an allowance must be made for it if the rates of return to schooling per se are to be identified. For further elaborations of this see Psacharopoulos and Layard (1979) and Lee (1980, Chapter 5).

5. $\{\sqrt{\text{antilog}}\,(\beta_{s2}) - 1\} 100\}/(s_2 - s_1)$, where $s_2 - s_1 > 0$, may be taken as an approximation of the marginal rate of return to schooling at each level; see Psacharopoulos and Layard (1979).

6. Tests for the stability of the basic earnings function used here show that there are no significant differences between the coefficients of the two sub-samples and those of the comple samples.

7. The use of dummy variables to represent MSSEE grades produced similar results.

8. For a discussion of the underlying simultaneous equation system, the simultaneity problem, and the choice and theoretical rationale of the variables used see Lee (1980, Chapter 6).

9. For further discussion see Goldberger (1964, pp. 197-200).

10. The use of a continuous variable for formal training, on the whole, produced insignificant results; see Lee (1980, Tables 6.3 and 6.6, pp. 186, 204).

Chapter III

1. Two broad categories of discrimination theories may be distinguished, i.e. the utility or taste hypothesis associated with Gary Becker (1971) and Kenneth Arrow (1970), and the crowding hypothesis associated with F.Y. Edgeworth (1922), Lester Thurow (1969), and Barbara Bergmann (1971).

2. In fact the differences in endowments can also be evaluated by using the low-wage equation, but this produces an interaction term which has no obvious interpretation; see Blinder (1973).

3. It has been shown that the differences between monthly salary and monthly earnings in terms of the rates of return to schooling, for instance, are not large; see Lee (1980, Chapters 4 to 7).

4. These ratios differ slightly from the ratio of average monthly salary since they are based on the average natural log of monthly salary. The entire analysis here is in terms of the natural log of monthly salary.

5. It has also been shown that the differences between monthly salary and monthly earnings in terms of the rates of returns to education, etc. are not large. However, the preference is for monthly earnings for the reasons given above.

6. The analysis here is also conducted in terms of the natural log of monthly earnings.

Chapter IV

1. For a discussion of the issue of labour market segmentation and the determinants of upward intersegmental mobility see Lee (1980, Chapter 9).

2. This model is a modified version of the model used by Leigh; see Leigh (1978).

3. Data on subordinate office workers and unskilled workers in the Industrial and Manual Group were not available at the time of the survey. Senior Division One personnel, on the other hand, tend to exceed the age limit set for this study.

4. The predominance of Malays in these occupations is due not only to differences in racial preferences but also to the provisions of the Federal Constitution. For instance, Article 153 of the Constitution sets a racial quota of four Malays to one non-Malay in the Police Force.

5. See Records Office, "Public Sector Manpower Survey, 1973". Computer Printouts, Public Services Department, Kuala Lumpur.

Chapter V

1. The problem of poverty and unemployment may be categorised as the employment problem defined in terms of the need to create not merely more jobs but more jobs providing a minimum standard of living (see Seers, 1971).

2. The objective of resolving the employment problem as defined in footnote one would be more encompassing than the objective of reducing the incidence of poverty and may be a more appropriate policy goal.

Appendix I

1. Cf. Department of Statistics, Business Expectations Survey: Peninsular Malaysia, First Quarter 1978, Kuala Lumpur: Department of Statistics, 1978.

2. Department of Statistics, Survey of Manufacturing Industries, Peninsular Malaysia, 1972, Kuala Lumpur: Department of Statistics, 1975.

3. See: Economic Planning Unit, "Report of the Manpower Survey in Malaysia, 1973", mimeographed, Kuala Lumpur, 1975.

4. Department of Statistics, Basic Population Tables, Volume 1, Kuala Lumpur, 1975.

5. See W.G. Cochran, Sampling Techniques, Third Edition, New York: John Wiley and Sons, 1977, pp. 10-11.

6. See Report of the Cabinet Committee Appointed by Cabinet to Examine the Revised Report of the Royal Salaries Commission, 1975, Kuala Lumpur: Government Printer, 1977, p. 96.

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SEAPRAP

THE SOUTHEAST ASIA POPULATION RESEARCH AWARDS PROGRAM

PROGRAM OBJECTIVES

* To strengthen the research capabilities of young Southeast Asian social scientists, and to provide them with technical support and guidance if required.

* To increase the quantity and quality of social science research on population problems in Southeast Asia.

* To facilitate the flow of information about population research developed in the program as well as its implications for policy and planning among researchers in the region, and between researchers, government planners and policy makers.

ILLUSTRATIVE RESEARCH AREAS

The range of the research areas include a wide variety of research problems relating to population, but excludes reproductive biology. The following are some examples of research areas that could fall within the general focus of the Program:

* Factors contributing to or related to fertility regulation and family planning programs; familial, psychological, social, political and economic effects of family planning and contraception.

* Antecedents, processes, and consequences (demographic, cultural, social, psychological, political, economic) of population structure, distribution, growth and change.

* Family structure, sexual behaviour and the relationship between child-bearing patterns and child development.

* Inter-relations between population variables and the process of social and economic development (housing, education, health, quality of the environment, etc).

* Population policy, including the interaction of population variables and economic policies, policy implications of population distribution and movement with reference to both urban and rural settings, and the interaction of population variables and law.

* Evaluation of on-going population education programs and/or development of knowledge-based population education program.

* Incentive schemes — infrastructures, opportunities; overall economic and social development programs.

SELECTION CRITERIA

Selection will be made by a Program Committee of distinguished Southeast Asian scholars in the social sciences and population. The following factors will be considered in evaluating research proposals:

1. relevance of the proposed research to current issues of population in the particular countries of Southeast Asia;
2. its potential contribution to policy formation, program implementation, and problem solving;
3. adequacy of research design, including problem definition, method of procedure, proposed mode of analysis, and knowledge of literature;
4. feasibility of the project, including time requirement; budget; and availability, accessibility, and reliability of data;
5. Applicant's potential for further development.

DURATION AND AMOUNT OF AWARDS

Research awards will be made for a period of up to one year. In exceptional cases, requests for limited extension may be considered. The amount of an award will depend on location, type and size of the project, but the maximum should not exceed US$7,500.

QUALIFICATIONS OF APPLICANTS

The Program is open to nationals of the following countries: Burma, Indonesia, Kampuchea, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam. Particular emphasis will be placed on attracting young social scientists in provincial areas.

Applications are invited from the following:

* Graduate students in thesis programs

* Faculty members

* Staff members in appropriate governmental and other organizations.

Full-time commitment is preferable but applicants must at least be able to devote a substantial part of their time to the research project. Advisers may be provided, depending on the needs of applicants.